ORDER NO.ODSD010949A1

B13

Service Manual

DVD Video Recorder

DMR-T2020

Colour

(K).....Black Type

Area

D......U.S.A. and Canada.

Please file and use this manual together with the service manual for Model No. DMR-E20D, Order No. ODSD010842C1.



SPECIFICATIONS

Specifications

Power supply: AC120 V, 60 Hz

Power consumption: 35 W

Recording system: DVD video recording

standards (DVD-RAM), DVD video standards (DVD-

R)

Optical pick-up: System with 1 lens, 2

integration units (662 nm wavelength for DVDs, 790 nm wavelength for CDs)

Recordable discs: 12 cm 4.7 GB DVD-RAM

discs

12 cm 9.4 GB DVD-RAM

discs

8 cm 2.8 GB DVD-RAM discs 12 cm 4.7 GB DVD-R discs (for General Ver. 2.0)

(101 General ver. 2

Recording time: Max. 6 hours

(using 4.7 GB disc)
XP: 60 minutes
SP: 120 minutes
LP: 240 minutes
EP: 360 minutes

Region number: Regin No.1

Discs played: 12 cm 4.7 GB DVD-RAM

discs

12 cm 9.4 GB DVD-RAM

discs

8 cm 2.8 GB DVD-RAM discs 12 cm 4.7 GB DVD-R discs (for General Ver. 2.0) DVD-VIDEO discs CD-Audio discs (CD-DA)

VideoCD discs CD-R/ CD-RW discs

(CD-DA, Video CD formatted

discs)

Video system

TV system: NTSC system, 525 lines, 60

fields

Recording system: MPEG2 (Hybrid VBR)

Input: LINE (pin jack), 1.0 Vp-p; 75

65

S connector Y: 1.0 Vp-p; 75 Ω C: 0.286 Vp-p; 75 Ω

Output: LINE (pin jack), 1.0 Vp-p; 75

Ω

S connector Y: 1.0 Vp-p; 75 $\,\Omega$ C: 0.286 Vp-p; 75 $\,\Omega$

Component video output 525i: Y: 1.0 Vp-p; 75 Ω

PB : 0.7 Vp-p; 75 Ω PR : 0.7 Vp-p; 75 Ω

Antenna reception input: TV Channel: 2ch-69ch, 75 $\, \Omega \,$

CATV Channel: 1ch-125ch,

75 Ω

Audio system

Recording system: Dolby Digital Input: LINE (pin jack)

Reference input: 309 mVrms FS: 2 Vrms (1 kHz, 0 dB) Input impedance: 47 k Ω

Output: LINE (pin jack)

Reference output: 309

mVrms

FS: 2 Vrms (1 kHz, 0 dB) Output impedance: 1 k Ω (Load impedance: 10 k Ω)

Number of channels: Recording: 2 channels

Playback: 2 channels

Other input/output connectors: Digital audio optical output

connector

Dimensions: Approx.

430 (W)×120 (H)×351 (D) mm

[Approx. 1615 /16 "(W)×43 /4

" (H)×137 /8 " (D)] (excludingprotrusions)

Mass: Approx. 5.6 kg (12.36 lbs)

Operating temperature range: 5 °C-40°C (41 °F-104 °F)

Operating humidity range: 10 %-80 % RH

(no condensation)

Clock unit: Quartz-controlled 12-hour

digital display

LASER Specification
Class I LASER Product

Wave length: 775-815 nm 655-666 nm
Laser power: No hazardous radiation is

emitted with the safety

protection.

Power consumption in standby mode:

approx. 5 W

Notes:

Specifications are subject to change without notice.

Mass and dimensions are approximate.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

1. Change in Replacement Parts List

Notes:

*Important safety notice:

Components identified by Amark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

*Warning: This product uses a laser diode. Refer to caution statements.

*ACHTUNG: Die lasereinheit nicht zerlegen. Die lasereinheit darf nur gegen enic vom hersteller spezifizierte einheit ausgetauscht werden.

*Capacity values are in microfarads (μ F) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

*The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation

of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

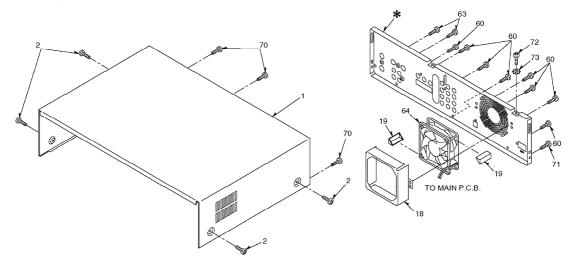
*"<IA>", "<IB>", marks in Remarks indicate languages of instruction manuals. [<IA>: English, <IB>: Canadian French]

All parts that are supplied by S.P.C..

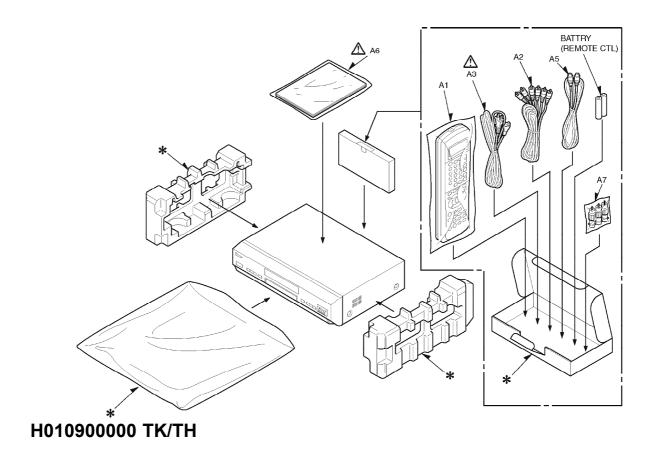
Ref.No.	Chang of Parts No.		Part Name & Description	Pcs	Remarks
	DMR-E20(D)	DMR- T2020(D)			
23	RGG0206C-K	RGG0206D-K	FRONT COVER	1	
67	ETXMM357A4	HETXMM371A4	POWER SUPPLY P.C.B.	1	(RTL) 🛆
71		XSN3+6FZ	SCREW	1	
72		XTN4+8FFC	SCREW	1	
73		XWC4BFC	WASHER	1	
A3	RJA0065-A	VJA0488	AC CORD	1	Δ
A6	RGT6035-P	RQT6136-P	OPERATING INSTRUCTIONS	1	<ia> ⚠</ia>
A6	RQT6036-C		OPERATING INSTRUCTIONS	0	
<u>A7</u>		K2RB063E000	CONNECTOR SET	1	
PC1	RPG5708	RPG5709	PACKING CASE	1	

2. Exploded Views

2.1. Casing Parts & Mechanism Section 1



2.2. Packing & Accessories Section



ORDER NO.ODSD010953C2

Service Manual

DVD Video Recorder

DMR-E20

Colour

(S).....Silver Type

Area

EB.....Great Britain.

EG.....Germany and Poland, etc..



SPECIFICATIONS

Specifications

Power supply: AC220-240 V, 50 Hz

Power consumption: 40 W

Recording system: DVD video recording standards

(DVD-RAM),

DVD video standards (DVD-R)

Recordable discs: 12 cm 4.7 GB DVD-RAM

12 cm 9.4 GB DVD-RAM 8 cm 2.8 GB DVD-RAM 12 cm 4.7 GB DVD-R (for General Ver. 2.0)

(101 General Ver. 2.0)

Recording time: Maximum 360 min.

(with 4.7 GB disc)
XP: Approx. 60 minutes
SP: Approx. 120 minutes
LP: Approx. 240 minutes
EP: Approx. 360 minutes

Region Number: Region No.2

Playing discs: 12 cm 4.7 GB DVD-RAM

12 cm 9.4 GB DVD-RAM 8 cm 2.8 GB DVD-RAM 12 cm 4.7 GB DVD-R (for General Ver. 2.0)

DVD-Video

CD-Audio (CD-DA)

Video CD CD-R/RW

(CD-DA, Video CD formatted discs)

Audio

Recording system: Dolby Digital, 2ch

Audio In: AV1/AV2 (21 pin) AV3/AV4 (pin jack)

Input Level: Standard: 0.5 Vms

Full scale: 2 Vms at 1k Hz

I Input Impedance more then 10k ohm

Audio Out: AV1/AV2 (21 pin) Audio Out (pin

jack)

Output Level: Standard: 0.5 Vms

Full scale: 2Vms at 1k Hz

Output Impedance: less than 1k ohm

Digital Audio Out: Optical terminal (PCM, Dolby

Digital, DTS, MPEG)

Television System

Tuner System: PAL B/G/H 75 ohm

Channel Coverage: VHF: CH E2-E12, A-H2(Italy)

UHF: CH 21-69 (DMR-E20EG Only)
UHF: CH 21-68 (DMR-E20EB Only)

CATV: CH S01-S05(S1-S3) S1-S20(M1-U10)

S21-S41[8MHz, RASTER]

RF Converter Output:

Video

Video System: PAL colour signal, 625 lines, 50

Not provided

fields

NTSC colour signal, 525 lines, 60

fields

Recoeding system: MPEG2 (Hybrid VBR)

Video in: AV1/AV2 (21 pin), AV3/AV4 (pin

jack)

1Vp-p 75 ohm, terminated

S-Video in: AV2 (21 pin), AV3/AV4 (S terminal)

1Vp-p 75 ohm, terminated

Video Out: AV1/AV2 (21 pin), Video Out (pin

jack)

1Vp-p 75 ohm, terminated

S-Video Out: AV1 (21 pin), S-Video Out(S

terminal)

1Vp-p 75 ohm, terminated

RGB Out: AV1(21 pin) 0.7Vp-p(PAL) 75ohm,

terminated

DV-Input: i.LINK/IEEE1394 Standard, 4-pin

Dimensions(W)x(D)x(H): Approx. 430x351x120 mm

Weight: Approx. 5.6 Kg

Operating Temperature: 5 °C-40°C

Operating Humidity range: 10 %-80 % RH (no condensation)

LEASER Specification Class 1 TLASER Product

> Wave Length: 775-815nm, 655-666nm

Laser Power: No hazardous radiation is emitted

with the safety protection

NORSK

Pickup 658 nm/790 nm

B^Ølgelende

Laser-styrke

Ingen farlig str³Ining sendes ut CLASSE 2/

CLASS E 1

Notes:

Mass and dimensions shown are approximate. Specifications are subject to change without notice.

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$oldsymbol{\Lambda}$ WARNING

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1. SAFETY PRECAUTIONS

1.1. GENERAL GUIDELINES

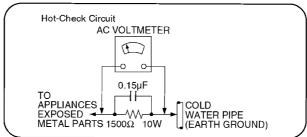
- 1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
- 2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
- 3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. LEAKAGE CURRENT COLD CHECK

- 1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to thechassis, the reading

should be between 1M Ω and 5.2M Ω . / When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

Figure 1



1.1.2. LEAKAGE CURRENT HOT CHECK (See Figure 1.)

- 1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
- 2. Connect a 1.5k Ω , 10 watts resistor, in parallel with a 0.15 μ F capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
- 3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
- 4. Check each exposed metallic part, and measure the voltage at each point.
- 5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
- 6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current mu3st not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

2. PREVENTION OF ELECTRO STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

- 1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, whichshould be removed for potential shock reasons prior to applying power to the unit under test.
- 2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as alminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
- 3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
- 4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
- 5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
- 6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, alminum foil or comparable conductive material).
- 7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

 Caution
 - Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
- 8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise hamless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient todamage an ES device).

■ IMPORTANT SAFETY NOTICE ■

There are special components used in this equipment which are imporant for safety. These parts are marked by \triangle in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

3. Precaution of Laser Diode

CAUTION:

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wave length: 775-815 nm/655-666 nm

Maximum output radiation power from pickup: 100 u.

Maximum output radiation power from pickup: 100 μ W/VDF

Laser radiation from the pickup lens is safety level, but be sure the followings:

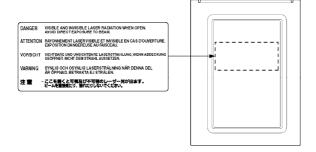
- 1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
- 2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
- 3. Do not look at the focus lens using optical instruments.
- 4. Recommend not to look at pickup lens for a long time.

ACHTUNG:

Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Leserstrahlung von der Laserinheit adgestrahit. Wellenlänge: 775-815 nm/655-666 nm Maximale Strahlungsleistung der Lasereinheit: 100 μ

Die Strahlungan der Lasereinheit ungefährlich, wenn folgende Punkte beachtet werden:

- Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
- Den werkseitig justierten Einstellregler der Lasereinhit nicht verstellen.
- Nicht mit optischen Instrumenten in die Fokussierlines blicken.
- 4. Nicht über längere Zeit in die Fokussierlines blicken.



4. How to replace the Lithium Battery

REPLACEMENT PROCEDURE

- 1. Remove the Top cover and DVD-RAM drive unit with Main P.C.B by referring the Disassembling Procedure.
- 2. Unsolder the Lithium Batteries: B1501, B7501 and then replace it into new one.

(As shown in 7.11. The power supply P.C.B.and main P.C.B)

NOTE:

The lithium battery is a critical component. (Type No.: CR2354-1GUF Manufactured by Panasonic.) It must never be subjected to excessive heat or discharge.

It must therefore only be fitted in equipment designed specifically for its use.

Replacement batteries must be of the same type and manufacture.

They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose.

It should be disposed of in waste products destined for burial rather than incineration.

(For English)

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

(For French)

PRECAUTION

Le fait de remplacer incorrectement la pile peut présenter des risques d'explosion.

Remplacer la pile uniquement par une pile identique ou de type équivalent recommandée par le fabricant. Se débarrasser des piles usagées conformément aux instructions du fabricant.

(For German)

VORSICHT

Bei einer falsch eingesetzten Batterie besteht Explosionsgefahr. Nur mit einer vom Hersteller empfohlenen Batterie vom gleichen Typ ersetzen.

Verbrauchte Batterien beim Fachhändler oder einer Sammelstelle für Sonderstoffe abliefern.

(For Swedish)

VARNING

Explosionsfara vid felaktigt batteribyte.

Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

(For Norwegian)

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig hándtering.

Udskiftning má kun ske med batteri af samme fabrikat og type.

Levér det brugte batteri tilbage til leverandøren.

(For Finnish)

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.

Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.

Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

5. General Description

- **5.1. Discs**
- 5.2. Control reference guide
- 5.3. Glossary
- 5.4. Maintenance and Handling and Glossary
- 5.5. Self-diagnosis
- 5.6. Error displays
- 5.7. Troubleshooting guide
- 5.8. Advice concerning handling of commodity

Please refer to a specified page of the operating instructions on the undermentioned item.

5.8.1. Confirmation of accessories

Acce	Accessories								
√ da	(Only for U.S.A.) To order accessories contact 1-8 (Only for Canada)	00-332-53	essories. Use numbers indicated in parent 168 or web site (http://www.panasonic.com whom you have made your purchase.		en asking for replacement parts.				
	Remote control1 (N2QAKB000011)		Batteries2 for remote control (R6 size)		AC Mains lead1 (RJA0053-3X)				
	Audio/Video cable1 (K2KA6CA00001)		RF lead to connect VCR and TV1 (K2KF2BA00001/K1TWACC00001)	Note					
	(IZINOONOO))		(IZIN ZDAGGOTIKI WAGGOGGT)	for use	cluded AC power supply cord is with this unit only. Luse it with other equipment.				

5.8.2. Remote control settings

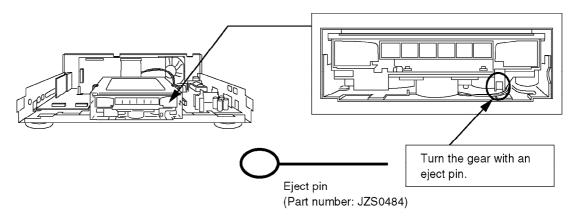
- 1. Two single batteries are put. (Accessories)
- 2. The television can be operated by remote control. (Refer to 10 page of operating instructions.)
- 3. Please set the remote control mode again when you use the equipment mode of our company.

 (Refer to 10 page of operating instructions.)
- 5.8.3. Antenna and television connections (Refer to 11-12 page of operating instructions.)
- 5.8.4. Selecting TV screen type (Refer to 16 page of operating instructions.)
- 5.8.5. Channel settings (Refer to 83 page of operating instructions.)
- 5.8.6. Changing the unit's settings (Refer to 74-85 page of operating instructions.)

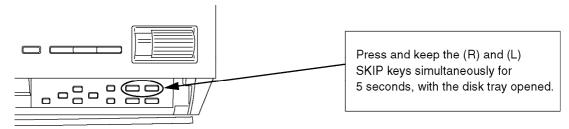
6. Notes When Servicing the Unit

Perform the servicing according to the following procedures.

- 6.1. When the disc of a customer cannot be pulled out due to a failure
- 1. Remove the top case and front case according to the disassembly procedures of each component.
- 2. Insert the eject pin into the hole on the front side of the drive to push the gear inside the hole several times. Then, the tray opens slowly. (The operation is as same as the operation in the RAM drive)



6.2. When the ratings password is forgotten



6.3. When the disk cannot be taken out due to sales demonstration lock function

(Press the open/close key and make sure that "LOCKED" appears on the display window.) In this condition, press the "Stop" and "Power" buttons simultaneously for 5 seconds while the unit is standstill, releasing the lock function.

(To make the unit "LOCKED" condition, press the "Stop" and "Power" buttons simultaneously for 5 seconds while the unit is standstill.)

6.4. Self-diagnosis function

The following code appears automatically on the display tube.

The description of each code is as follows.

Code	Meaning	Cause	Operation	Remedy
U11	Media error	The disc is contaminated or damaged.	The code is displayed for 5 seconds and the unit becomes the stand-by mode unless the timer REC function is used.	
		The disc is judged as inapplicable one.	When the timer REC function is used, the code stays on the display tube.	Press the po and open/clc keys.
		Information stored in the disc is broken.	After the code is displayed for 5 seconds, power is turned off automatically. When the power is turned on again, "Read" function begins and the code "U11" is redisplayed.	
U14 The temperature in the unit is too high. When the drive temperature exceeds 71 degrees, the		temperature exceeds 71	The power for the unit body is turned off by force and the unit cannot accept the key in 30 minutes. (The fan motor operates for 5 minutes and stops for 25 minutes.)	
U99 The The microprocessor is hung up. The shows		microprocessor	The code "U99" stays on the display tube.	Unplug the u and plug it a
CHK / REMOTE	The remote control code is wrong.		The code "CHK REMOTE" is displayed for 5 seconds.	Change to th correct code

To check the following error codes, set the unit to the service mode.

To set the unit to the service mode, press and keep the [Pause], [Open/Close] and [Stop] keys simultaneously for about 10 seconds when the power is off.

After that, "Service Mode" is displayed. Then, press the numerical channel key "2" on the remote control.

Code	Meaning	Cause	Operation	Remedy
H01	The fan motor isn't rotating.		The code "H01" stays on the display.	Check the power suppl the fan.
F00	No error information is provided.	An error code is reset.	The code "F00" stays on the display.	
F01	Hardware error in the RAM Drive.	Failed RAM drive unit	The code "F01" stays on the display.	Replace the RAM Drive.
F12	Failed in initializing the microprocessor for automatic recording.	The microprocessor is hung up.	The code "F12" stays on the display.	Check the tir REC after plugging the unit again.

By pressing the numerical channel key "0" on the remote control, the unit is returned to the service mode.

Other functions in the service mode

All settings are returned to the defaults by pressing the numerical channel key "4" on the remote

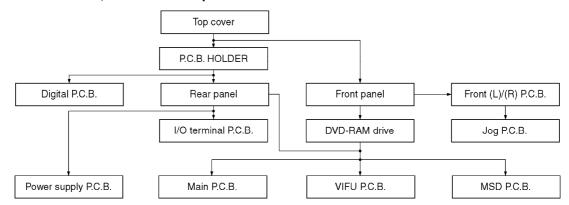
control in the service mode above.

7. Assembling and Disassembling

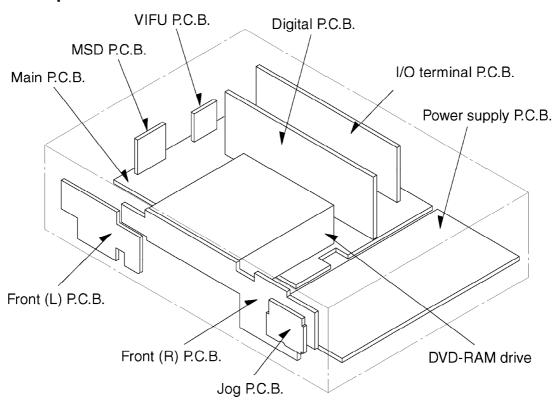
7.1. Disassembly flow chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the flow chart below.

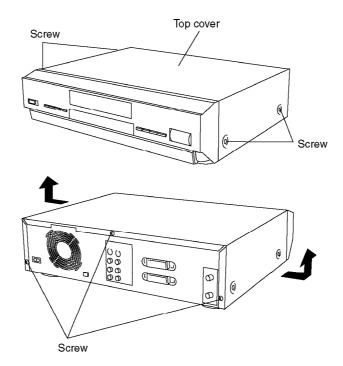


7.2. P.C.B. positions

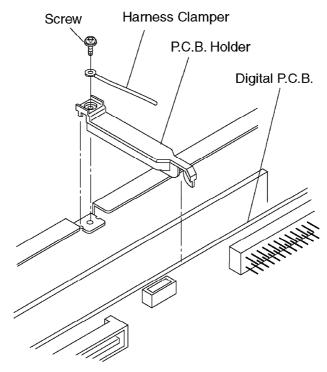


7.3. The top cover

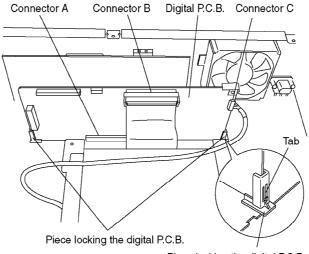
- 1. Remove the 7 screws.
- 2. Open the both ends at the front side of the top cover a bit and lift the top cover in the direction of the arrows.



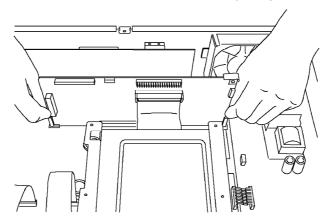
- 7.4. The digital P.C.B.
- 1. Remove the screw.
- 2. Remove the harness clamper.



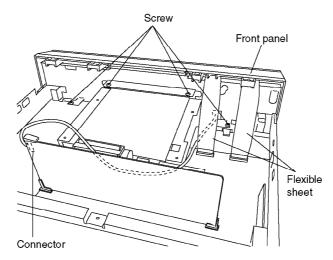
- 3. Remove the connector B.
- 4. Open the tabs for the pieces locking the digital P.C.B. and slowly lift the digital P.C.B. in the vertical direction to remove the connector A.
- 5. Remove the connector C.



Piece locking the digital P.C.B.

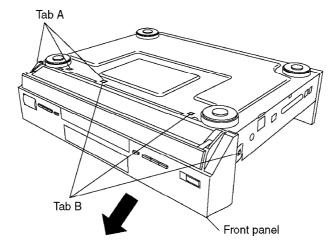


- 7.5. The front panel
- 1. Remove the flexible sheets.
- 2. Remove the 4 screws.
- 3. Remove the connector.

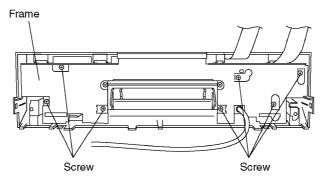


4. Remove the 3 screws A and 3 screws B in this order. (The screws A and the screws B should be removed at the same time, respectively.)

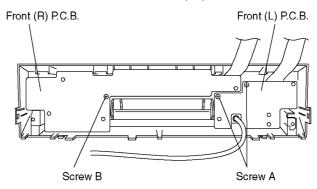
5. Move the front panel to your side slowly and remove it.



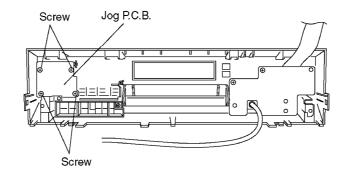
- 7.6. The front (L)/(R) P.C.B and jog P.C.B.
- 1. Remove the 7 screws.
- 2. Remove the frame.



- 3. Remove the 2 screws A and the front (L) P.C.B. in this order.
- 4. Remove the 1 screw B and the front (R) P.C.B. in this order.

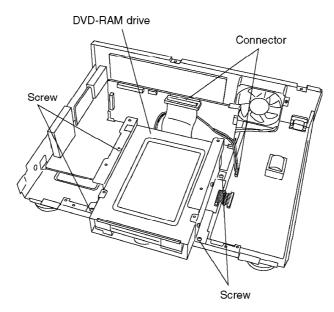


5. Remove the 4 screws and the jog P.C.B. in this order.



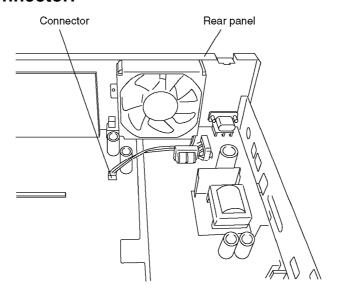
7.7. The DVD-RAM drive

- 1. Remove the connectors.
- 2. Remove the 4 screws.



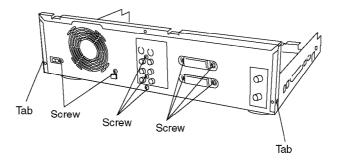
7.8. The rear panel

1. Remove the connector.

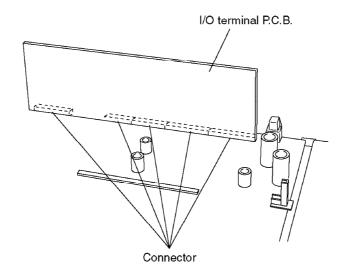


2. Remove the 9 screws.

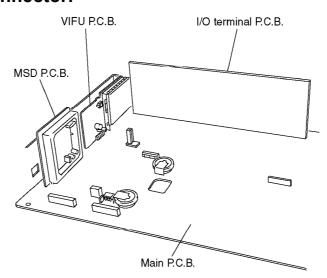
3. Remove the tabs.



- 7.9. The I/O terminal P.C.B.
- 1. Remove the connectors.

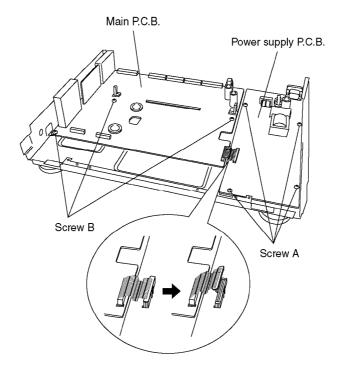


- 7.10. The MSD P.C.B. and VIFU P.C.B.
- 1. Remove the solder.
- 2. Remove the connector.



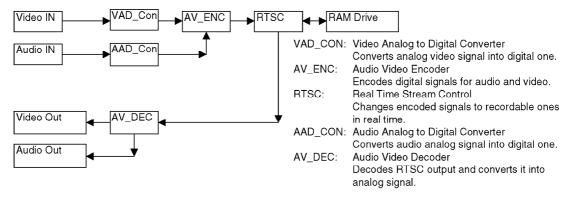
7.11. The power supply P.C.B. and main P.C.B.

- 1. Remove the 4 screws A.
- 2. Remove the connector.
- 3. Remove the power supply P.C.B.
- 4. Remove the 3 screws B.
- 5. Remove the main P.C.B.



8. Technical Information

8.1. Outline of DVD Recorder

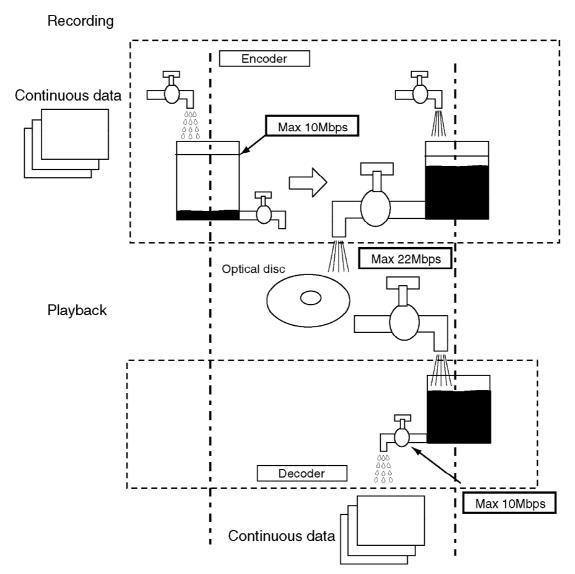


8.2. Concept of Simultaneous Playback and Recording

- 1. Continuous recording signal is stored in the memory at 10 Mbps. Data can be written in the disc at 22 Mbps (using only about a half of the recording time).
- 2. In the time difference shown at step 1, data is output from the disc to the memory at 22 Mbps. And the playback is also output as

continuous data at 10 Mbps.

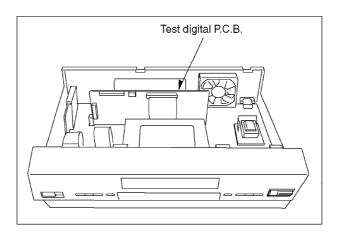
3. The encoder and decoder always operate and change over from recording to playback or vice versa by using about twofold transmission time difference.



9. Service positions and tools

- 9.1. Digital P.C.B. check
- 1. Remove top cover.
- 2. Remove digital P.C.B.
- 3. Mount test digital P.C.B.

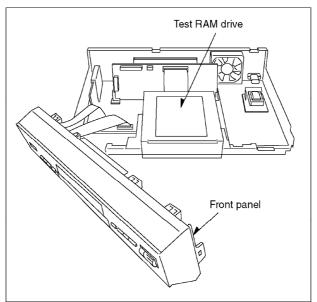
<Digital P.C.B. check>



Test digital P.C.B.					
RFKBDMRE20S JAPAN MODEL					
RFKBDMRE20D	USA MODEL				
RFKBDMRE20EG	PAL MODEL				

- 9.2. RAM drive check
- 1. Remove top cover.
- 2. Remove front panel.
- 3. Replace RAM drive.

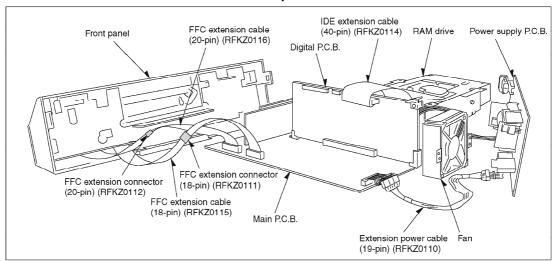




	Test RAM drive	
VXY1641		

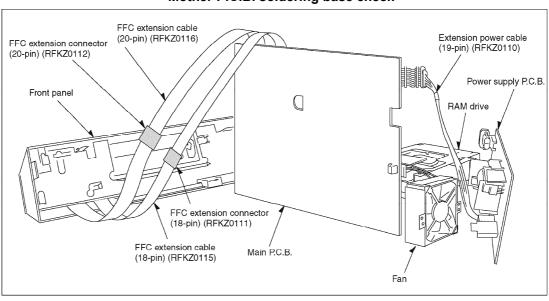
- 9.3. Main P.C.B. and power supply P.C.B. check
- 1. Remove top cover.

- 2. Remove front panel.
- 3. Remove rear panel.
- 4. Remove RAM drive.
- 5. Remove mother P.C.B. from bottom plate.
- 6. Remove power supply P.C.B. from bottom plate.
- 7. Connect IDE extension cable to RAM drive.
- 8. Connect extension power cable to power supply P.C.B.
- 9. Connect FFC extension cable (18-pin) to front panel FFC (18-pin).
- 10. Connect FFC extension cable (20-pin) to front panel FFC (20-pin).

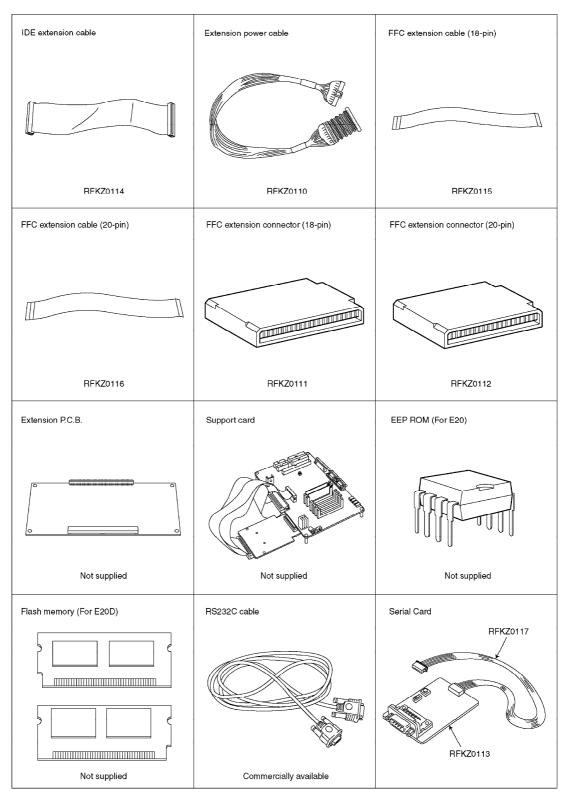


<Mother P.C.B. components base check>



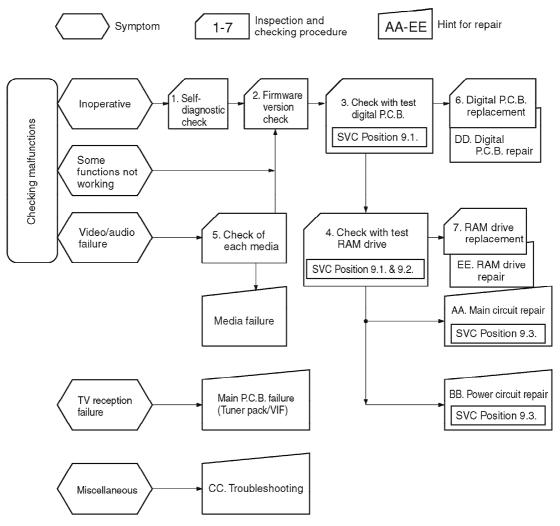


9.4. Service tools



10. Repair and checking procedures

10.1. Flow chart



10.2. Inspection and checking procedures

- 1. Checking self-diagnosis function
- 1. Presence of error code on display (Serviceable on user site)

Display	Cause	Countermeasure	Judgment
U11	Stained or damaged disc / Incompatible disc	Load another disc.	<ng> Drive failure, or digital P.C.B. (RTSC circuit) failure <ok> Disc failure</ok></ng>
1 CHK REMOTE	Remote control and main unit code are not matched.	Switch the setting by "remote control mode" in initial setting.	
U14	Inner temperature is abnormally high.	The unit cannot be operated for approx. 30 minutes. Normal operation is restored when temperature comes down.	a. Check whether cooling fan is block or not. b. Room temperature is abnormally h
U99	System stack	Turn off main unit power, and then turn it on again. If there is no change, keep pressing the power switch for 10 seconds.	

2. Checking other error codes

<Procedure>

- A. Enter the service mode.
 - While power is off, press [Pause], [Open/Close] and [Stop] keys simultaneously.
- B. View the error code.
 - Set [DVD/TV] switch on remote control to DVD.
 - Press the channel key [2] on remote control. (Error code is kept displayed until pressing any key.)
- C. Meanings

Display	Cause	Countermeasure	Judgment
H01	Stationary fan motor	Power check	
		Mother P.C.B. check	
F00	No error information (Initial setting)		No error could be detected with self-diagnosis function.
F01	Drive hardware error	Replacement of drive	unit
F12	Communication error between timer processor (main P.C.B.) and main processor (digital P.C.B.)	Go to the inspection and checking procedure 3.	

D. Exit the service mode.

- Turn off the power with remote control power switch.

2. Checking firmware version

- 1. Firmware is subject to regular updating for performance enhancement. Check if the symptom at user can be solved with firmware updating. If yes, update the firmware.
 - <Firmware version check procedure>
 - A. Enter the service mode.
 - While power is off, press [Pause], [Open/Close] and [Stop] keys simultaneously. "SERVICE MODE" will be displayed on FIP.
 - B. Check firmware version on FL display.
 - Set [DVD/TV] switch on remote controller to DVD.
 - Press the channel key [5] on remote controller. (If you want the display reappear, press the key [5] again.)

FL display	Countermeasure
Top: Firmware name [Region]	Unable to modify
Bottom: Version No., North America	
[1], Japan [2]	
Top: Firmware name [MAIN]	Modify with updating disc if
Bottom: Version No. [2229DO]	necessary.
Top: Firmware name [TIMER]	Unable to modify
Bottom: Version No. [2011DO]	(IC must be replaced to make
	modification.)
Top: Firmware name [DRIVE]	Modify with updating disc if
Bottom: Version No. [A107]	necessary.

^{*} Firmware is automatically updated when RAM4.7G firmware disc is loaded.

After updated, perform "Resorting Factory Setting". (Refer to page 33.)

- 3. Digital P.C.B. check
- See description in 8.1 Service position.
- 1. If operation becomes normal after replacement with test P.C.B., it means digital P.C.B. failure.
- 2. If operation does not become normal after replacement with test P.C.B., follow the next step.
- 4. Drive unit check
- See description in 8.2 Service position.
- 1. If operation becomes normal after replacement with test RAM drive unit, it means drive unit failure.
- 2. If operation does not become normal after replacement, it means mother P.C.B. failure.
- 5. Check of each media
- 1. Play DVD video.
- 2. Record/play of RAM disc from TV channel and L1 input
- 3. Play music CD.
- 6. Digital P.C.B. replacement
- a. No adjustment is needed.
- b. Check performance of each media.
- 7. RAM drive replacement
- 1. When the unit does not operate normally after replacement with a new RAM drive
 - A. While power is off, press Skip(R), [Pause], [Open/Close] keys simultaneously.

(Digital P.C.B. sends out the region code to RAM drive.) Display

Top [FACT] Bottom [MODE1]

B. Turn off the power after a few seconds, and then turn it on again to resume normal operation.

Caution: In this case, all settings are initialized.

10.3. Hint for repair

AA. Main circuit repair

- 1. Separation of video and audio systems
 - Using internal oscillation of video signal (white/magenta signal)
 - 1. Enter the service mode. / [Service mode: While power is off, press [Pause], [Open/Close] and [Stop] keys simultaneously.]
 - 2. Set [DVD/TV] switch on remote controller to DVD.
 - 3. When [Display] key is pressed, digital P.C.B. produces white picture and chroma 100% signal output.
 - 4. When [Audio] key is pressed, digital P.C.B. produces magenta/chroma 100% signal output.
 - Using internal oscillation of audio signal
 - 1. Enter the service mode. / [Service mode: While power is off, press [Pause], [Open/Close] and [Stop] keys simultaneously.] When [†] key is pressed, digital P.C.B. produces 1kHz±0dB (AC3/5.1ch sine wave) signal.
- 2. Separation of REC, PLAY and EE systems
 - Check PLAY system and REC system circuits in EE2 mode.
 (EE2 mode: L1 input signal passes the same circuit as REC system and PLAY system except for RAM drive.)
 - 1. Enter the service mode. / [Service mode: While power is off, press [Pause], [Open/Close] and [Stop] keys simultaneously.]
 - 2. Set [DVD/TV] switch on remote controller to DVD.
 - 3. When the channel key [7] is pressed, the unit enters REC/PLAY system in XP mode.
 - 4. When the channel key [8] is pressed, the unit enters REC/PLAY system in SP mode.
 - 5. When the channel key [9] is pressed, the unit enters REC/PLAY

system in LP mode.

3. When unit is inoperative

Checking timer microprocessor circuit

When timer microprocessor was replaced, the following level meter adjustment is required and "Resorting Factory Setting" is required.

<Adjustment procedure>

- 1. Give 1Khz/-10dBV input to "L", "R" and audio input terminals of L1.
- 2. Enter the service mode. While power is off, press [Pause], [Open/Close] and [Stop] keys simultaneously.
- 3. Set [DVD/TV] switch on remote controller to DVD, and press the channel key [1].
- 4. [ADJUST] and [MTR] displays appear, and the adjustment is done automatically.
- 5. Although the display does not disappear, the adjustment is finished when the meter lights up.
- 6. End the adjustment by turning the power off.

4. Display tube partly not illuminated

- 1. Enter the service mode. / [Service mode: While power is off, press [Pause], [Open/Close] and [Stop] keys simultaneously.]
- 2. Set [DVD/TV] switch on remote controller to DVD, and press the channel key [6].
- 3. All segment LEDs light up.
- 4. If all light up, display tube and LED are normal.
- 5. Turn the power off, or press the channel key [0].

Last procedure

a. Resorting factory setting

When timer memory or digital P.C.B. is replaced, the data in each memory is altered. In this case, restore the factory setting after repair.

- 1. Enter the service mode. / [Service mode: While power is off, press [Pause], [Open/Close]and [Stop] keys simultaneously.]
 - 2. Set [DVD/TV] switch on remote controller to DVD, and press the channel key [4].
 - 3. Turn the power off, or press the channel key [0].

Or, while power is off, press [SKIP], [Pause] and [Open/Close] keys simultaneously.

Note:

If customer set up "Child Lock" mode, cancel it with holding down [RETURN] and [CANCEL] button simultaneously and perform "Resorting factory setting".

b. Aging

After the repair with unstable factors, perform aging.

Use the following service mode for aging.

- 1. Load on the tray a RAM disc that has at least one program recorded.
- 2. Set at LP or EP in REC mode.
- 3. Press [Pause], [Open/Close] and [CH Down] keys simultaneously for 5 to 10 seconds.

4. Sequential operation. (endless)

Format
$$\longrightarrow$$
 REC \longrightarrow Play \longrightarrow STOP \longrightarrow Play \longrightarrow SKIP(R) \longrightarrow Cue \longrightarrow

Stop \longleftarrow Play \longleftarrow R-Slow \longleftarrow Slow \longleftarrow Pause \longleftarrow PLAY \longleftarrow Rev \longleftarrow

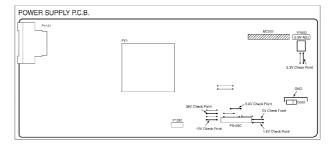
5. Turn off power stop.

BB. Power circuit repair

1. After replacement of MC502, 3.3V adjustment is required.

<Adjustment procedure>

- 1. Connect Voltmeter between "3.3V Check Point" and "GND"
- 2. Adjust VR503 so that the voltage value be comes 3.3V.



CC. Troubleshooting

- 1. When rating password (viewer restriction ID) is forgotten. While the tray is open, press [Skip(R)] and [Skip(L)] keys simultaneously.
- 2. When "Sales demonstration Lock" function remains on.
 While the unit is in stop, press [Stop] and [Power] keys simultaneously.
- 3. In the case of deck stack.

 Keep pressing the power switch for about 10 seconds.

DD. Digital P.C.B. repair

1. Refer to operation instruction for support card.

EE. RAM drive repair

- 1. Refer to service manual for VXY1641.
- 10.4. Special modes at a glance

(1) Mode list

	Item	Description	FL display	Screen	Key operation	
				display	Main unit key	Remote controller k
1	U/H/F display	FL display of error code For U/H/F, the last	Top: [U is displayed automatically. For H/F, see se	rvice mode.
		error code is memorized. → Last error display in service mode.	→ See (2).		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
2	Initialization of ratings password	Set the viewer restriction level to "8", and ID number to "0000". (This command is described in the operation manual.)			[Skip(R)] + [Skip(F)] while tray is open	
3	Shop demo lock	Prohibits disc removal to prevent	Top: [LOCK] for 3 seconds.		[STOP] + [POWER]	
	function	the disc from missing during shop demonstration → Setting → Cleared * Prohibition is effective until cleared. (Main unitinitialization does not affect it.)	Top: [UNLOCK] for 3 seconds.		while in stop (EE display)	
4	Forced power-off function	When deck is powered on, it is powered off forcibly.			Keep pressing [POWER] for 10 seconds.	
5	Sequential tests	Sequential tests are performed automatically according to test items. Note: Turn off power to stop.			[PAUSE] + [OPEN/ CLOSE] + [CH DOWN] while in stop (EE display)	

	Item	Description	FL display	Screen	Key operation		
				display	Main unit key	Remote controller k	
6	Service mode	The mode is used in servicing.	Top: [SERVIC] Bottom: [E MODE]		[PAUSE] + [OPEN/ CLOSE] + [STOP] while power is off		
		0. Clear item Items 1~22 are cleared.	Top: [SERVIC] Bottom: [E MODE]			[0] while in service mode	
		1. Level meter adjustment After replacement of timer microprocessor, standard signal is given to L1 input to execute this command.	Top: [ADJUST] Bottom: [MTR]			[1] while in service mode	
		→ Adjustment is done automatically.					
		2. Error code display FL display of the last error code held by timer	Top: [■ ▲] Bottom: [] (● : U/H/F, ▲ : Number) → See(2).			[2] while in service mode	
		3. Error code initialization Initialization of the last error code held by timer (Write in F00)	Top: [ERROR] Bottom: [INIT]			[3] while in service mode	
		4. Main unit initialization All parameters (including timer) are initialized to the factory setting.	Top: [FACT] Bottom: [INIT]			[4] while in service mode	
		5. ROM version display Region code, main, timer and drive firmware versions are displayed on screen and FL tube.	Top: [REGION] Bottom: [[5] while in service mod	
			Bottom: [

-	■] for 5 seconds ↓ Top:[DRIVE] Bottom: [■■■■]		
	for 5 seconds		
6. Illumination of all FL //LEDs All FL and LEDs are lit up.	All FL/LEDs light up.	 	[6] while in service mode
7. RTSC return XP (A& V) Disc recording of L1 input Encoded and decoded for external output without playback. REC mode is XP.	Top: [EE2] Bottom: [XP AV]	 	[7] while in service mode

ltem	Description FL display		Screen	Key operation		
			display	Main unit key	Remote controller k	
	8. RTSC return SP (A&V) Disc recording of L1 input Encoded and decoded for external output without playback. REC mode is SP.	Top: [EE2] Bottom: [SP AV]			[8] while in service mode	
	9. RTSC return LP (A&V) Disc recording of L1 input Encoded and decoded for external output without playback. REC mode is LP.	Top: [EE2] Bottom: [LP AV]			[9] while in service mode	
	10. Audio Mute (XTMUTE) To check if XTMUTE (mute from timer) works normally	Top: [TIMER] Bottom: [MUTE]			[Top window while in serv mode	
	11. Audio Mute (XDMUTE) To check if XDMUTE (mute from main) works normally	Top: [MAIN] Bottom: [MUTE]			[Top Menu] while in serv mode	
	12. S1 signal output Forced overlapping of S1 signal on EE in order to check S terminal output	'			[Menu] while service mode	
	13. PB(H) High Voltage output Forced high voltage output at AV 21-pin PB(H)	Top: [PB8] Bottom: [HIGH]				
	14. S2 signal output Forced overlapping of S2 signal on EE in order to check S terminal output	Top: [S2] Bottom: [OUTPUT] kept displayed			[Display] wh in service mo	
	15. PB8 (H) Middle Voltage output Forced middle voltage output at AV	Top: [PB8] Bottom: [MIDDLE]				

16. Laser use time	Top: [LASER]	 	[Last marker
display	Bottom: [hhhhhH]		while in serv
To check laser use time of drive	h: Unit time		mode
17. White picture	Top: [WHIT I]	 	[Status] whil
output	Bottom: []		in service me
White picture output			
from AV decoder			
White picture (Chroma: 100%)			
Switching enabled by			
sub-command "I/P			
switch"	T PAA OF 13		FA 11 - 7 1- 11
18. Magenta picture output	Top: [MAGE I] Bottom: []	 	[Audio] while
Magenta picture	Bottom. []		Sci vice mou
output from AV			
decoder			
Magenta picture			
(Chroma: 100%) Switching enabled by			
sub-command "I/P			
switch"			
19. Audio pattern	Top: [AUDIO]	 	[🌡] while in
output	Bottom: []		service mod
Audio pattern output of internal memory			
1KHz±0dB (AC3 5.1ch			
sine wave)			
Switching enabled by			
sub-command			
"Speaker balance check"			
20. I/P switching	Top: [[← 1 while i
"Interleave" and	Bottom: []		[←] while in
"Progressive" are	(Command execution)		
switched. Initial	(communa oncouncil)		
setting is "Interleave".	Top: [P]		
(This command is effective when	Bottom:[]		
performing 17 and 18.)	On command execution		
	after this, the display		
	returns to the one of		

	Item	Description	FL display	Screen	Key operation		
				display	Main unit key	Remote controller k	
		21. Speaker balance check Each speaker output is changed to the following value. FL [0dB], [0dB],[0dB] FR [0dB], [0dB],[0dB] SL [0dB], [+6dB],[-6dB] SR [0dB], [+6dB],[-6dB] CNT[0dB], [+6dB],[-6dB] SW [0dB], [+6dB],[-6dB] Initial setting is "0dB" for each. (This command is effective when performing 19.)	Top: [AUDIO] Bottom: [SPB 0] ↓ (Command execution) Top: [AUDIO] Bottom: [SPB +6] ↓ (Command execution) Top: [AUDIO] Bottom: [SPB Å 6] Oncommand execution after this, the display returns to the one of initial setting.			[←] while ir service mod	
		22. Clearing service mode Power off (Service mode is cleared also when AC is turned off.)				[] (Pow SW) while in service mode	
7	ATP initialization (North America) / ATP re- execution (PAL)	North America: ATP setting is initialized. PAL: ATP is re-executed. (ATP: Auto turnning program)			[CH [↑]] + [CH ↓] while in stop (EE display)		
8	FACTORY MODE1	Refer to page 32 : 10-2 -7	Top: [FACT] Bottom: [MODE 1]		[SKIP(R)] + [PAUSE] + [OPEN/ CLOSE] while power is off		

Note 1: 6-1~22 are effective when no media is loaded in the main unit.

Note 2: 6-12 and 6-14 are effective for E20 (domestic), E20 (North America) and HS1 (domestic).

Note 3: 6-13 and 6-15 are effective for E20-PAL.

Note 4: 6-20 and 6-21 are effective for HS1.

Note 5: 6-4 initializes error code and laser use time.

Note 6: 7 is effective for E20 (North America) and E20-PAL.

Note 7: Simultaneous key pressing becomes effective after 5 seconds unless otherwise described.

(2) U/H/F display

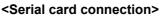
Display	Diagnosis	Description	FL display	Scree displa
U11	Media error	Display appears: a. When stained or damaged disc is detected b. When authentication process error is returned in FS and RTSC c. When incompatible disc is detected	Top: [U11] Bottom: [] a. Displayed for 5 seconds unless the unit is in TIMER REC mode b. Display continues when the unit is in TIMER REC mode (until user presses power and open/ closekey)	
		Display appears when broken disc information is detected.	Top: [U11] Bottom: [] a. After displaying above for 5 seconds, power is turned off. b. When power is turned on next time, U11 is displayed for 5 seconds after READ display.	
	Remote control	Display appears when main unit and remote controller modes are not matched.	Top: [1 U12] (Domestic) Bottom: [] for 5 seconds [1] is the number for main unit's remote control mode.	
			Top: [1 CHK] (North America) Bottom: [] for 5 seconds	
			Top: [REMOTE] (PAL) Bottom: [DVD 1] for 5 seconds	
U14	Abnormal inner temperature detected	Display appears when the drive temperature exceeds 71Åé. Main unit is powered off forcibly. For 30 minutes after this, all key entries are disabled. (Fan motor operates at the highest speedfor the first 5 minutes. For the remaining 25 minutes, fan motor is also stopped.) The event is saved in memory as well.	Top: [U14] Bottom: [] Displayed from the time of detection and while key entries are disabled after power-off (30 minutes).	
U99	Hang-up	Displayed when microprocessor has hang-up.	Top: [U99] Bottom: [] remains displayed.	
H01	Inoperative fan motor	Display appears when inoperative fan motor is detected after powered on.	Top: [H01] Bottom: [] remains displayed.	
F00	No error information	Initial setting for error code in memory (Initialization is possible with error code initialization and main unit initialization.)	Top: [F00] Bottom: [] remains displayed.	

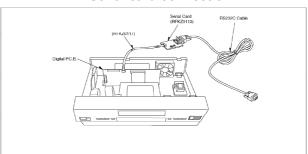
Display	Diagnosis	Description	FL display	Scree displa
F01	Drive hardware error	Display appears when drive unit error is detected. The event is saved in memory.	Top: [F01] Bottom: [] remains displayed.	
F12	Initialization error when main microprocessor is started up for program recording	Display appears when initialization error is detected after starting up main microprocessor for program recording. The event is saved in memory.	Top: [F12] Bottom: [] remains displayed.	

11. Adjustment Procedure

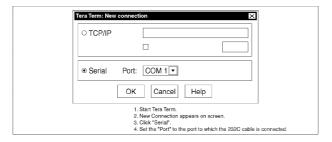
Preparation

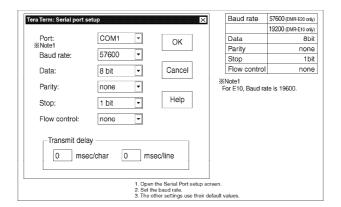
- <Equipment>
- +PC
- +Serial Card (RFK0117) (RFK0113)
- +RS232C Close Cable
- 1. Install RS232C Communication Program (Teraterm software) in your PC.
- 2. Connect Serial card to a unit.





3. Execute Teraterm and set up according to the following Figure. <Hereafter, explaining with Teraterm Software>



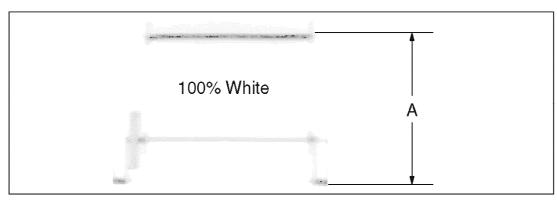


11.1. Luminance Level Adjustment

*Mesurment: Point; Video Out

*Input signal: Internal OSC, 100% White signal

*Specification: A=1000 ± 20mV



Procedure

1. Set Service Mode

Press [Pause], [Open/Close] and [STOP] Key at the same time for 5sec.

2. Set Internal OSC.

Press [STATUS] key. It will display [WHIT I] on FL.

3. Set Adjustment Mode.

Press [---]. On FL, it will display [EVR].

4. Input the following code.

YY 0 100

YY: Address Command

0: Value setting Command

100: Value

5. Measure [A] value.

If lower than specification, then input again [YY 0] and value more than 100.

If higher than specification, then input again [YY 0] and value less than

100.

Repeat above procedures so that a value is the same as above specification.

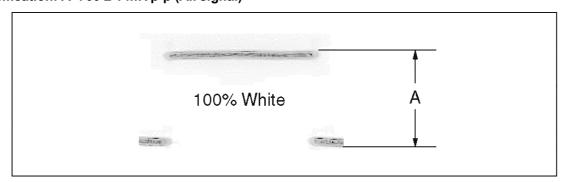
11.2. RGB output level Adjustment

(Connect 75 ohm between pin11 and pin19 on 21-pin Scart socket.)

*Mesurment:

B Signal (Address command is CB): Pin 7 on Scart socket G signal (Address command is GG): Pin 11 on Scart socket R signal (Address command is CR): Pin 15 on Scart socket

*Input signal: Internal OSC, 100% White signal *Specification: A=700 ± 14mVp-p (All signal)



Procedure for B Signal

1. Set Service Mode

Press [Pause], [Open/Close] and [STOP] Key at the same time for 5sec.

2. Set Internal OSC.

Press [STATUS] key. It will display [WHIT I] on FL.

3. Set Adjustment Mode.

Press []. On FL, it will display [EVR].

4. Input the following code.

CB 0 100

CB: Address Command
0: Value setting Command

100: Value

5. Measure [A] value.

If lower than specification, then input again [CB 0] and value more than 100.

If higher than specification, then input again [CB 0] and value less than 100.

Repeat above procedures so that a value is the same as above specification.

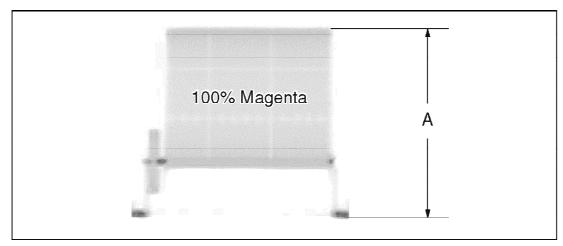
For G signal and R signal, repeat the same as above procedures.

11.3. Magenta Level Adjustment

*Mesurment: Point; Video Out

*Input signal: Internal OSC, 100% Magenta signal

*Specification: A=700 ± 14mV



Procedure

1. Set Service Mode

Press [Pause], [Open/Close] and [STOP] Key at the same time for 5sec.

2. Set Internal OSC.

Press [AUDIO] key. It will display [MAGE I] on FL.

3. Set Adjustment Mode.

Press []. On FL, it will display [EVR].

4. Input the following code.

CC 0 100

YY: Address Command
0: Value setting Command
100: Value

5. Measure [A] value.

If lower than specification, then input again [CC 0] and value more than 100.

If higher than specification, then input again [CC 0] and value less than 100.

Repeat above procedures so that a value is the same as above specification.

12. Abbreviations

ABBREVIATIONS

INITIAL/LOGO

	IALICOO	ADDICEVIATION			
A	ACLK AD0~UP ADATA ALE AMUTE AREQ ARF ASI	ADDRESS AUDIO CLOCK ADDRESS BUS AUDIO PES PACKET DATA ADDRESS LATCH ENABLE AUDIO MUTE AUDIO PES PACKET REQUEST AUDIO RF SERVO AMP INVERTED INPUT SERVO AMPOUTPUT AUDIO WORD DISTINCTION SYNC			
В	BDO BLKCK BOTTOM BYP	BIT CLOCK (PCM) BIT CLOCK INPUT BLACK DROP OUT SUB CODE BLOCK CLOCK CAP. FOR BOTTOM HOLD BYPATH BYTE CLOCK			
С	CD CDSCK	CONSTANT ANGULAR VELOCITY CAP. BLACK DROP OUT COMPACT DISC			
	CDRF CDV CHNDATA CKSL CLV COFTR CPA CPCS CPDT CPUADR CPUADT CPUIRQ CPRD CPWR CS CSYNCIN	CD SERIAL DATA CD SERIAL DATA CD RF (EFM) SIGNAL COMPACT DISC-VIDEO CHANNEL DATA SYSTEM CLOCKSELECT CONSTANT LINEAR VELOCITY CAP. OFF TRACK CPU ADDRESS CPU CHIP SELECT CPU DATA CPU ADDRESS LATCH CPU ADDRESS DATA BUS CPU INTERRUPT REQUEST CPU READ ENABLE CPU WRITE ENABLE CHIPSELECT COMPOSITE SYNC IN COMPOSITE SYNC OUT	D	DACCK DEEMP DEMPH DIGO~UP DIN DMSRCK DMUTE DO DOUTO~UP DRF DRPOUT DREQ DRESP DSC DSLF DVD	ABBREVIATIONS D/A CONVERTER CLOCK DEEMPHASIS BIT ON/OFF DEEMPHASIS SWITCHING FL DIGIT OUTPUT DATA INPUT DM SERIAL DATA READ CLOCK DIGITAL MUTE CONTROL DROP OUT DATAOUTPUT DATA SLICE RF (BIAS) DROP OUT SIGNAL DATA REQUEST DATA RESPONSE DIGITAL SERVO CONTROLLER DATA SLICE LOOP FILTER DIGITAL VIDEO DISC

INIT	TAL/LOGO	ABBREVIATIONS			
E	EC	ERROR TORQUE CONTROL			
	ECR	ERROR TORQUE CONTROL			
		REFERENCE			
	ENCSEL	ENCODER SELECT			
	ETMCLK	EXTERNAL M CLOCK (81MHz/			
	ETSCLK	40.5MHz)			
		EXTERNAL S CLOCK (54MHz)			
F	FBAL	FOCUS BALANCE			
	FCLK	FRAME CLOCK			
	FE	FOCUS ERROR			
	FFI	FOCUS ERROR AMP			
	FEO	INVERTED INPUT			
	FG	FOCUS ERROR AMP OUTPUT			
	FSC	FREQUENCY GENERATOR			
	FSCK	FREQUENCY SUB CARRIER			
		FS (384 OVER SAMPLING) CLOCK			
G	GND	COMMON GROUNDING			
		(EARTH)			
Н	HA0~UP	HOST ADDRESS			
	HD0~UP	HOST DATA			
	HINT	HOST INTERRUPT			
	HRXW	HOST READ/WRITE			
I	IECOUT	IEC958 FORMAT DATA			
	IPFRAG	OUTPUT			
	IREF	INTERPOLATION FLAG			
	ISEL	I (CURRENT) REFERENCE			
L	LDON	INTERFACE MODE SELECT LASER DIODE CONTROL	INIT	TAL/LOGO	ABBREVIATIONS
-	LPC	LASER POWER CONTROL	0	ODC	OPTICAL DISC CONTROLLER
	LRCK	L CH/R CH DISTINCTION		OFTR	OFF TRACKING
		CLOCK		osci	OSCILLATOR INPUT
М	MA0~UP	MEMORY ADDRESS		osco	OSCILLATOR OUTPUT
	MCK	MEMORY CLOCK		OSD	ON SCREEN DISPLAY
	MCKI	MEMORY CLOCK INPUT	Р	P1~UP	PORT
	MCLK	MEMORY SERIAL COMMAND		PCD	CD TRACKING PHASE
	MDATA	CLOCK		PCK	DIFFERENCE
	MDQ0~UP	MEMORY SERIAL COMMAND		PDVD	PLL CLOCK
	MDQM	DATA		PEAK	DVD TRACKING PHASE
	MLD	MEMORY DATA INPUT/OUTPUT		PLLCLK /	DIFFERENCE
	MPEG			PLLOK	CAP. FOR PEAK HOLD CHANNEL PLL CLOCK
		MEMORY DATA I/O MASK		PWMCTL	PLL LOCK
		MEMORYSERIAL COMMAND LOAD		PWMDA B	PWM OUTPUT CONTROL
		MOVING PICTURE EXPERTS		P WINIOA, B	PULSE WAVE MOTOR DRIVEA
		GROUP			PULSE WAVE MOTOR OUT A, B
		U1.001			I SECE TIATE MOTOR OUT A, D

11411	IAL/LUGU	ADDREVIATIONS			
R	RE	READ ENABLE			
	RFENV	RF ENVELOPE			
	RFO	RF PHASE DIFFERENCE			
	RS	OUTPUT			
	RSEL	(CD-ROM) REGISTER SELECT			
	RST	RF POLARITY SELECT			
	RSV	RESET			
		RESERVE			
S	SBI0, 1	SERIAL DATA INPUT			
	SBO0	SERIAL DATA OUTPUT			
	SBT0, 1	SERIAL CLOCK			
	SCK	SERIAL DATA CLOCK			
	SCKR	AUDIO SERIAL CLOCK			
	SCL	RECEIVER			
	SCLK	SERIAL CLOCK			
	SDA	SERIAL CLOCK			
	SEG0~UP	SERIAL DATA			
	SELCLK	FL SEGMENT OUTPUT			
	SEN	SELECTCLOCK			
	SIN1, 2	SERIAL PORT ENABLE			
	SOUT1, 2	SERIAL DATA IN			
	SPDI	SERIAL DATA OUT			
	SPDO	SERIAL PORT DATA INPUT			
	SPEN	SERIAL PORT DATA OUTPUT			
	SPRCLK	SERIAL PORT R/W ENABLE			
	SPWCLK	SERIAL PORT READ CLOCK			
	SQCK	SERIAL PORT WRITE CLOCK			
	0 4 0 %	SUB CODE Q CLOCK			
	_	SUBCODE Q DATA READ			
	CINIADIN	CLOCK			
	SRMDT0~7	SERIAL DATA			
		SRAM ADDRESS BUS	18117	"IAI /I 000	ADDDEVIATIONS
	SS	SRAM DATA BUS 0~7		IAL/LOGO	ABBREVIATIONS
	STAT	START/STOP	Т	TE	TRACKING ERROR
	0.02	STATUS		TIBAL	BALANCE CONTROL
		STREAM DATA CLOCK		TID	BALANCE OUTPUT 1
	STENABLE	STREAM DATA		TIN	BALANCE INPUT
		STREAM DATA INPUT ENABLE		TIP	BALANCE INPUT
	STSEL	STREAM DATA POLARITY		TIS	BALANCE OUTPUT 2
	STVALID	SELECT		TPSN	OP AMP OUTPUT
	SUBC	STREAM DATAVALIDITY		TPSO	OP AMP OUTPUT
	SBCK	SUB CODE SERIAL		TPSP	OP AMP INVERTED INPUT
	SUBQ	SUB CODE CLOCK		TRCRS	TRACK CROSSSIGNAL
	SYSCLK	SUB CODE Q DATA		TRON	TRACKING ON
		SYSTEM CLOCK		TRSON	TRAVERSE SERVO ON

INITIAL/LOGO

ABBREVIATIONS

INIT	TIAL/LOGO	ABBREVIATIONS			
٧	VBLANK	V BLANKING			
	VCC	COLLECTOR POWER SUPPLY			
		VOLTAGE			
	VCDCONT	VIDEO CD CONTROL			
		(TRACKING			
	VDD	BALANCE)			
	VFB	DRAIN POWER SUPPLY			
	VREF	VOLTAGE			
	VSS	VIDEO FEED BACK			
		VOLTAGE REFERENCE			
		SOURCE POWER			
		SUPPLYVOLTAGE			
W	WAIT	BUS CYCLE WAIT			
	WDCK	WORD CLOCK			
	WEH	WRITE ENABLE HIGH			
	WSR	WORD SELECT RECEIVER			
X	X	X' TAL			
	XALE	X ADDRESS LATCH ENABLE			
	XAREQ	X AUDIO DATA REQUEST			
	XCDROM	X CD ROM CHIP SELECT			
	XCS	X CHIP SELECT			
	XCSYNC	X COMPOSITE SYNC			
	XDS	X DATA STROBE			
	XHSYNCO	X HORIZONTAL SYNC OUTPUT			
	XHINT	XH INTERRUPTREQUEST			
	XI	X' TAL OSCILLATOR INPUT			
	XINT	X INTERRUPT			
	XMW	X MEMORY WRITE ENABLE			
	XO	X' TAL OSCILLATOR OUTPUT			
	XRE	X READ ENABLE			
	XSRMCE	X SRAM CHIP ENABLE			
	XSRMOE	X SRAM OUTPUT ENABLE			
	XSRMWE	X SRAM WRITE ENABLE			
	xvcs	X V-DEC CHIPSELECT			
	XVDS	X V-DEC CONTROL BUS			
	XVSYNCO	STROBE			
		X VERTICAL SYNC OUTPUT			

13. Voltage Chart

13.1. Power Supply P.C.B.

13.2. Main P.C.B.

13.3. VIFU P.C.B.

- 13.4. Front-L P.C.B. and Front-R P.C.B.
- 13.5. MSD P.C.B.
- 13.6. I/O Terminal P.C.B.

14. Block Diagram

- 14.1. Analog Section (Main P.C.B.)
- 14.1.1. Analog Video
- 14.1.2. Analog Audio

15. Schematic Diagram

- 15.1. Interconnection
- 15.2. Power Supply
- 15.3. Sub Power Section (Main P.C.B. (1/6))
- 15.4. Main Net Section (Main P.C.B. (2/6))
- 15.5. Video Main Section (Main P.C.B. (3/6))
- 15.6. Audio Main Section (Main P.C.B. (4/6))
- 15.7. Timer Section (Main P.C.B. (5/6))
- 15.8. RF Inter Section (Main P.C.B. (6/6))
- 15.9. I/O Terminal
- 15.10. VIFU
- 15.11. MSD
- 15.12. Front-L
- 15.13. Front-R
- 15.14. Jog

16. Print Circuit Board

- 16.1. Power Supply P.C.B.
- 16.2. Main P.C.B. Location Map , Address Information
- 16.2.1. Main P.C.B. (Component Side) Location Map

- 16.2.2. Main P.C.B. (Foil Side) Location Map
- 16.2.3. Main P.C.B. Address Information

16.3. Main P.C.B. (Component Side)

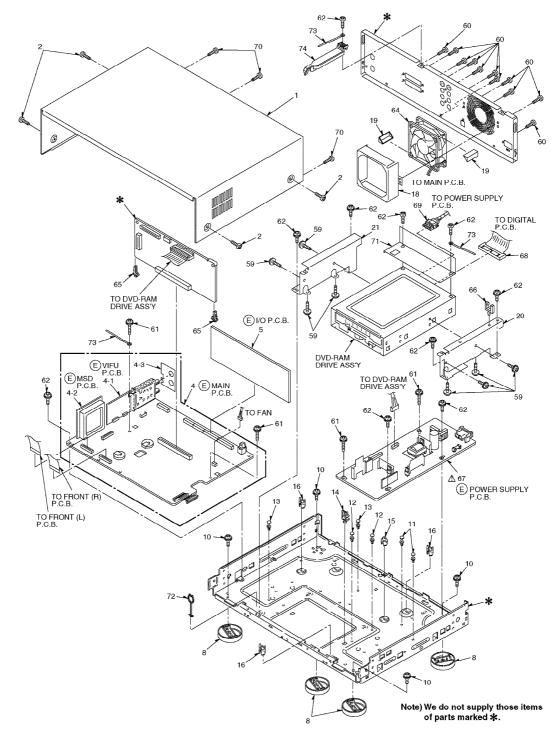
- 16.3.1. Main P.C.B. (Component Side) 1/4 Section
- 16.3.2. Main P.C.B. (Component Side) 2/4 Section
- 16.3.3. Main P.C.B. (Component Side) 3/4 Section
- 16.3.4. Main P.C.B. (Component Side) 4/4 Section

16.4. Main P.C.B. (Foil Side)

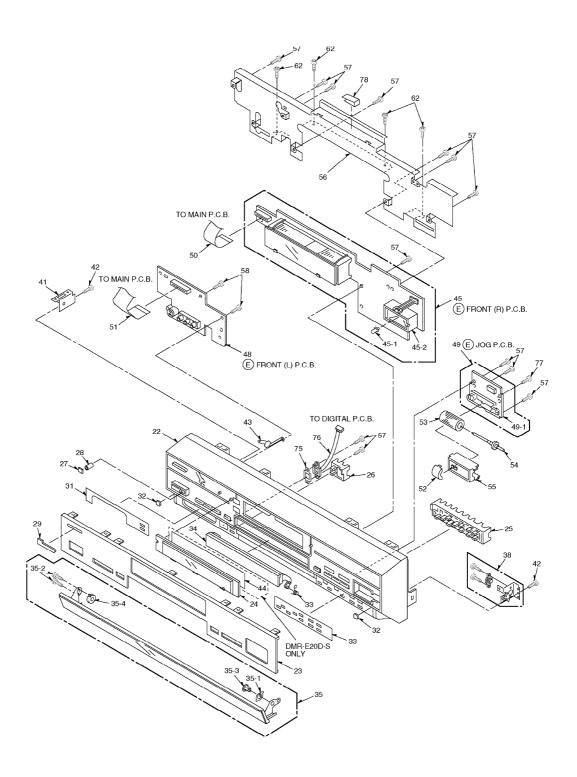
- 16.4.1. Main P.C.B. (Foil Side) 1/4 Section
- 16.4.2. Main P.C.B. (Foil Side) 2/4 Section
- 16.4.3. Main P.C.B. (Foil Side) 3/4 Section
- 16.4.4. Main P.C.B. (Foil Side) 4/4 Section
- 16.5. I/O Terminal P.C.B.
- 16.6. VIFU P.C.B.
- 16.7. MSD P.C.B.
- 16.8. Front-L P.C.B. And Front-R P.C.B. And Jog P.C.B.

17. EXPLODED VIEWS

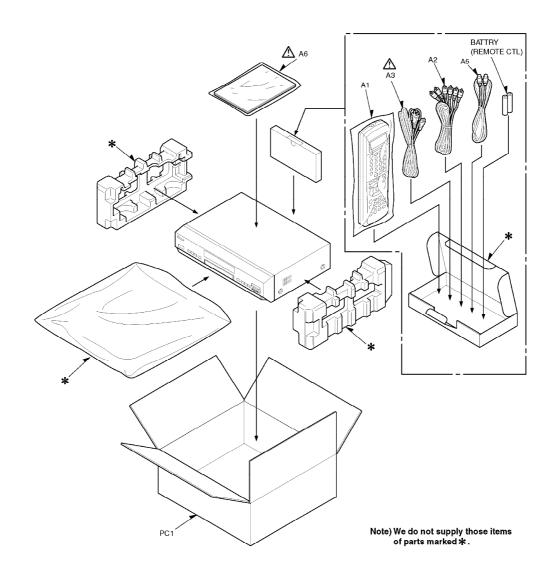
17.1. Casing Parts & Mechanism Section 1



17.2. Casing Parts & Mechanism Section 2



17.3. Packing & Accessories Section



18. REPLACEMENT PARTS LIST

Notes:

*Important safety notice:

Components identified by A mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

- *Warning: This product uses a laser diode. Refer to caution statements.
- *ACHTUNG: Die lasereinheit nicht zerlegen. Die lasereinheit darf nur gegen enic vom hersteller spezifizierte einheit ausgetauscht werden.
- *Capacity values are in microfarads (μ F) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).
- *Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).
- *The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
- *"<IA>", "<IB>", "<IC>", "<ID>", marks in Remarks indicate languages of instruction manuals.[<IA>: English/ Spanish, <IB>: English, <IC>: Germany/ Italian, <ID>: French/ Dutch]
- *"(EB)", "(EG)", marks in Remarks indicate models. [(EB): DMR-E20EB-S, (EG): DMR-E20EG-S] *"*1", "*2", "*3", "*4", marks in Remarks indicate P.C.B.s.
- [*1: VIFU P.C.B. (EB), *2: VIFU P.C.B. (EG), *3: FRONT(R) P.C.B., *4: FRONT(L) P.C.B.] All parts that are supplied by S.P.C..

Ref. No.	Part No. Part Name & Description		Pcs	Remarks
1	RKM0447-S	TOP COVER	1	
 2	SNE2129	SCREW	4	
<u>4</u>	REP3219C	MAIN P.C.B.	1	(RTL)(EG)
4	REP3219D	MAIN P.C.B.	1	(RTL)(EB)
4-1	VEP07A23AL	VIFU P.C.B.	1	(RTL)(EG)
4-1	VEP07A23AM	VIFU P.C.B.	1	(RTL)(EB)
4-2	VEP07A18AA	MSD P.C.B.	1	(RTL)(EB)
4-2	VEP07A18AJ	MSD P.C.B.	1	(RTL)(EG)
<u>4-3</u>	RMC0458	EARTH PLATE	1	
<u>5</u>	REP3221A	I/O P.C.B.	1	(RTL)
8	VYK5504	LEG	4	
10	XTV3+8G	SCREW	4	
<u>11</u>	VKC0392	SPACER(A)	2	
12	RMN0091	SPACER(B)	2	
<u>13</u>	VMX2233	P.C.B. SPACER	2	
14	RMN0666	CARD CORNER HOLDER	1	
<u>15</u>	VMP4323	P.C.B. SUPPORT(A)	1	
<u>16</u>	VMP6639	P.C.B. SUPPORT(B)	3	
<u>18</u>	VMP6304	FAN HOLDER	1	
<u>19</u>	VMX3014	CUSHION(FAN)	2	
20	RMA1477	DRIVE ANGLE (R)	1	
<u>21</u>	RMA1478	DRIVE ANGLE (L)	1	
<u>22</u>	RYP1061-S	FRONT PANEL ASS'Y2	1	
23	RGG0206A-S	FRONT COVER	1	
24	RGK1421-Q	FL ORNAMENT	1	
<u>25</u>	RGU2017-S	SKIP BUTTON	1	
<u> 26</u>	RGU2018-S	TIMER BUTTON	1	
<u>27</u>	RKW0659-S	IR WINDOW	1	
<u>28</u>	RGQ0315-S	IR WINDOW GUIDE	1	
29	VGB0217	PANASONIC BADGE	1	
30	RGH0160-S	DOOR PLATE(R)	1	
<u>31</u>	RGH0161B-S	DOOR PLATE(L)	1	
<u>32</u>	VMT1092	CUSHION	2	
33	VMB3410	BLINDER SPRING	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
<u>34</u>	RYF0602-S	TRAY DOOR ASS'Y	1	
<u>35</u>	RYF0603B-S	DOOR ASS'Y	1	(EG)
35	RYF0603C-S	DOOR ASS'Y	1	(EB)
<u>35-1</u>	VMC1544	EARTH SPRING (D)	1	
35-2	XQN2+AG4	SCREW	2	
<u>35-3</u>	VGQ5334	SHAFT GUIDE (R)	1	
35-4	VGQ5427	CLICK PIECE	1	
38	RXA0188	ANGLE (R) ASS'Y	1	
<u>41</u>	VXA6377	ANGLE (L) ASS'Y	1	
42	XTN26+6G	SCREW	2	
43	RMC0454	EARTH SPRING	1	
44	RKW0664-S	MIRROR FILTER	1	
<u>45</u>	REP3222CA	FRONT(R) P.C.B.	1	(RTL)
<u>45-1</u>	RGQ0316-A	LED CAP	1	
45-2	RGL0559-W	SHADING PIECE	1	
48	REP3222CB	FRONT(L) P.C.B.	1	
 49	REP3222CC	JOG P.C.B.	1	
49-1	RMN0664	ROLLER BASE	1	
50	VWJ1514	FRONT(R)-MAIN FFC	1	
51	VWJ1515	FRONT(L)-MAIN FFC	1	
52	RGK1416-S	ROLLER COVER	1	
<u>52</u> 53	RGZ0051-S	ROLLER DRUM	1	
54	RMS0752	ROLLER SHAFT	1	
	RGL0560-Q	LIGHT PIECE	1	
<u>55</u>			_	
<u>56</u>	RMA1480	FRONT ANGLE	1	
57	XTBS26+10J	SCREW	13	
58	XTN26+6G	SCREW	2	
59	XYN3+F6	SCREW	8	
60	VHD0690	SCREW	11	
61	XTN3+16F-C	SCREW	4	
62	XTN3+6F	SCREW	14	
<u>64</u>	VRF0233	FAN	1	L6FALEFH0008
<u>65</u>	RMN0203	CUSHION(FAN)	2	
<u>66</u>	RMN0675	CLAMPER	1	
<u>67</u>	ETXMM357E4H	POWER SUPPLY P.C.B.	1	(RTL) 🗥
68	VEE0P98	DRIVE-DIGITAL CABLE	1	
69	VEE0S37	DRIVE-POWER CABLE	1	
70	VHD0690	SCREW	3	
71	RMA1524	SHIELD ANGLE	1	
72	VMX3015	HARNESS LIFTER	1	
73	VJF1443	CLUMPER	3	
74	RGQ0323-C	PCB HOLDER	1	
7 <u>5</u>	RMC0463	EARTH PLATE B (DV)	1	
7 <u>6</u>	VEE0Q08	INNER1394 CABLE	1	
<u>76</u> 77	XTBS26+14JFN		1	
		SCREW SHIELD FINCER	_	
<u>78</u>	RMC0466	SHIELD FINGER	1	
Λ4	N2O A V D000044	DEMOTE CONTROL ASSIV		
<u>A1</u>	N2QAKB000011	REMOTE CONTROL ASS'Y	1	WOWA OO A COOC
<u>A2</u>	VJA0788-D	A/V CORD	1	K2KA6CA00001
<u>A3</u>	RJA0053-3X	AC CORD	1	(EB) <u></u>
A3	VJA1059	AC CORD	1	K2CQ2DA00001 (EG)
A5	VJA1089	RF COAXIAL CABLE	1	K1TWACC00001
A6	RQT6037-B	OPERATING INSTRUCTIONS	1	
<u></u>	1/0/1003/-0	OI LIATING INSTRUCTIONS	'	<ib>(EB) △</ib>
A6	RQT6038-E	OPERATING INSTRUCTIONS	1	<ia>(EG)</ia>
	RQT6039-D	OPERATING INSTRUCTIONS	1	<ic>(EG)</ic>

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
A6	RQT6144-J	OPERATING INSTRUCTIONS	1	<id>(EG)</id>
				,
B1501	CR2354-1GUF	LITHIUM BATTERY	1	
B7501	CR2354-1GUF	LITHIUM BATTERY	1	
		-		
C001,02	KH471K	470P	2	Δ
C003	ECQU2A104ML	0.1U	1	Δ
C004	ECQU2A224ML	0.22	1	Δ
C005	KH471K	470P	1	Δ
C006	KMX2G680L	400V 68	1	
C007	KMG1V470	35V 47U	1	
C008,09	ECKRRS332ME	3300P	2	Δ
C012,13	ECKRRS102KB	1000P	2	<u> </u>
C501	ECQV1H474JL	50V 0.47U	1	
C502	LXV1E121	25V 120U	1	
C502 C503	ECQE1A104SKF	10V 0.1U	1	
C503	LXV1A102	10V 0.10	1	
C504 C505	LXV1A102 LXV1E821	25V 820U	1	
	_			
C507	KMG1E331	25V 330U	1	
C508	ECQV1H104JL	50V 0.1U	1	
C509	KMG1H220	50V 22U	1	
C510	LXV1A102	10V 1000U	1	
C511	KMG1E331	25V 330U	1	
C512	KMG1A331	10V 330U	1	
C514,15	LXV1A102	10V 1000U	2	
C516,17	KMG1H220	50V 22U	2	
C519	KMG1A331	10V 330U	1	
C520	KMG1C471	10V 470U	1	
C521	KMG1E471	25V 470U	1	
C522	KMG1A471	10V 470U	1	
C524	ECQV1H104JL	50V 0.1U	1	
C526,27	KMG1A471	10V 470U	2	
C528	KMG1H010	50V 1U	1	
C529	ECKN3A471KRP	1000V 470U	1	
C530	LXV1E121	25V 120U	1	
C532	KMG1A471	10V 470U	1	
C0701	ECJ2VF1C105Z	16V 1U	1	
C0702	ECUV1H102KBV	50V 1000P	1	ECJ1VB1H102K
C0703	ECJ2YB1A105K	10V 1U	1	
C0704	ECUM1E333KBN	25V 0.033U	1	
C0707	ECEA1HKA2R2	50V 2.2U	1	
C0708	ECEA1HKAR47	50V 0.47U	1	
C0710	ECJ1VF1H103Z	50V 0.01U	1	
C0711	ECEA1CKA220	16V 22U	1	
C0712	ECUX1C104ZFV	16V 0.1U	1	
C0713	ECEA0JKA331	6.3V 330U	1	
C0714	ECJ2VF1C105Z	16V 1U	1	
C0715	ECJ1VC1H030C	50V 3P	1	(EG)
C0715	ECUV1H120JCV	50V 12P	1	ECJ1VC1H120J (EB)
C0717	ECUM1H330GU	50V 33U	1	(LD)
C0717	ECUV1E104ZFV	25V 0.1U	1	F1H1E104A030
C0719 C0721	ECUV1H121JCV	50V 120P	1	(EG)
	_007 11112100V	007 1201		(-0)
C0721	ECUV1H820JCV	50V 82P	1	ECJ1VC1H820J (EB)

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C0724	ECUV1H331KBV	50V 330P	1	ECJ1VB1H331K (EB)
C1501	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C1504	ECUX1C104ZFV	16V 0.1U	1	
C1505	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C1508	VCEA1ABS470	10V 47P	1	F2A1A4700004
C1509	ECUX1C104ZFV	16V 0.1U	1	
C1510,11	VCEA0JBS470	6.3V 47P	2	F2A0J470A005
C1512	ECUX1C104ZFV	16V 0.1U	1	
C1513	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C1514	ECUX1C104ZFV	16V 0.1U	1	
C1515	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C1516	ECUX1C104ZFV	16V 0.1U	1	
C1519,20	VCEA1CBS470	16V 47P	2	F2A1C470A006
C1521	VCEA1ABS470	10V 47P	1	F2A1A4700004
C1522	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C1523	ECUX1C104ZFV	16V 0.1U	1	
C1524	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C1527,28	VCEA0JBS470	6.3V 47P	2	F2A0J470A005
C1530	ECUX1C104ZFV	16V 0.1U	1	
C1530	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C3007	ECEA0JKA470	6.3V 47U	1	. 2007/ UAUU
C3007	ECJ1VF1H103Z	50V 0.01U	3	
C3008-10	ECEA1AKN470	10V 47U	1	
C3011	ECEA0JKA470	6.3V 47U	1	
C3012 C3013,14	ECJ1VF1H103Z	50V 0.01U	2	
C3015,14 C3015	ECEA1CKA100	16V 10U	1	
C3016	ECA0JM102	6.3V 1000U	1	
C3017	ECEA1CKA100	16V 10U	1	
C3018	ECA0JM102	6.3V 1000U	1	
C3023-25	ECJ1VF1H103Z	50V 0.01U	3	
C3028	ECEA1HKN010	50V 1U	1	
C3029	ECJ1VF1H103Z	50V 0.01U	1	
C3031	ECEA0JKA470	6.3V 47U	1	
C3032	ECJ1VF1H103Z	50V 0.01U	1	
C3033	ECEA1HKN010	50V 1U	1	
C3034	ECJ1VF1H103Z	50V 0.01U	1	
C3035	ECEA1HKN010	50V 1U	1	
C3036	ECEA1HKA010	50V 1U	1	
C3037	ECJ1VF1H103Z	50V 0.01U	1	
C3038,39	ECEA1HKA010	50V 1U	2	
C3040	ECJ1VF1H103Z	50V 0.01U	1	
C3041	ECEA1HKA010	50V 1U	1	
C3042	ECEA1CKA100	16V 10U	1	
C3061	ECEA0JKN470	6.3V 47U	1	
C3063,64	ECEA0JKN470	6.3V 47U	2	
C3071	ECJ1VF1H103Z	50V 0.01U	1	
C3901,02	ECUV1H470JCV	50V 47P	2	
C3905	ECUX1C104ZFV	16V 0.1U	1	
C3906	ECUX1H103KBV	50V 0.01U	1	
C3907,08	ECUV1H471JCV	50V 470P	2	ECJ1VC1H471J
C3910,11	ECA1CAK100X	16V 10U	2	
C3912-17	ECA1HAK010X	50V 1U	6	
C3918,19	ECA1CAK100X	16V 10U	2	
C3920	ECUX1C104ZFV	16V 0.1U	1	
C3921	ECEA0JKA331	6.3V 330U	1	
C3922	ECUX1H103KBV	50V 0.01U	1	
C3923	ECUX1C104ZFV	16V 0.1U	1	+

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C3924	ECEA0JKA331	6.3V 330U	1	
C3925-27	ECUX1H103KBV	50V 0.01U	3	
C3928,29	ECA1HAK010X	50V 1U	2	
C3930	ECUX1H103KBV	50V 0.01U	1	
C3931,32	ECA1HAK010X	50V 1U	2	
C3933	ECEA1HKA010	50V 1U	1	
C3934	ECUX1H103KBV	50V 0.01U	1	
C3935	ECA1CAK470X	16V 47U	1	
C3936,37	ECEA1HKN010	50V 1U	2	
C3938,39	ECUX1H103KBV	50V 0.01U	2	
C3940	ECEA0JKA221	6.3V 220U	1	
C3941	ECUX1H103KBV	50V 0.01U	1	
C3951,52	ECUV1H470JCV	50V 47P	2	
C3953,54	ECUV1H471JCV	50V 470P	2	ECJ1VC1H471J
C3955,56	ECUV1H101JCV	50V 100P	2	ECJ1VC1H101J
C3957,58	ECUV1H471JCV	50V 470P	2	ECJ1VC1H471J
C3959,60	ECUV1H470JCV	50V 47P	2	
C3961,62	ECUV1H101JCV	50V 100P	2	ECJ1VC1H101J
C3963	ECUX1H103KBV	50V 0.01U	1	
C3971	ECEA0JKA221	6.3V 220U	1	
C3972	ECUX1C104ZFV	16V 0.1U	1	
C3973	ERJ6GEY0R00V	1/10W 0	1	
C3974	ECUV1C104KBV	16V 0.1U	1	ECJ1VB1C104K
C3975,76	ERJ6GEY0R00V	1/10W 0	2	
C3977,78	ECEA1AKN470	10V 47U	2	
C3979	ECUX1C104ZFV	16V 0.1U	1	
C3980	ECEA1AKN470	10V 47U	1	
C3981	ECUX1C104ZFV	16V 0.1U	1	
C3982	ECEA0JKS101	6.3V 100U	1	
C3983	ECEA1CKA220	16V 22U	1	
C3984	ECEA0JKS101	6.3V 100U	1	
C3985	ECEA1CKA220	16V 22U	1	
C3986	ECEA0JKS101	6.3V 100U	1	
C3987	ECEA1CKA220	16V 22U	1	
C4001	ECA1CAK100X	16V 10U	1	
C4002	ECUX1C104ZFV	16V 0.1U	1	
C4003	ECA1CAK100X	16V 10U	1	
C4004	ECUX1C104ZFV	16V 0.1U	1	
C4005	ECA1CAK100X	16V 10U	1	
C4006	ECUX1C104ZFV	16V 0.1U	1	
C4007	ECA1CAK100X	16V 10U	1	
C4008	ECUX1C104ZFV	16V 0.1U	1	
C4009,10	ECA1CAK100X	16V 10U	2	
C4011	ECA1CAK220X	16V 22U	1	
C4011	ECUX1C104ZFV	16V 0.1U	1	
C4012	ECA1CAK100X	16V 10U	1	
C4013	ECUX1C104ZFV	16V 0.1U	2	
C4014,15	ECA1CAK470X	16V 47U	2	
C4018,17	ECA1CAK100X	16V 10U	1	
C4018	ECUX1C104ZFV	16V 0.1U	1	
C4019 C4020	ECA1CAK100X	16V 10U	1	
C4020 C4021	ECUX1C104ZFV	16V 0.1U	1	
	ECA1HAK2R2X		1	
C4022	ECUX1C104ZFV	50V 2.2U	1	
C4023		16V 0.1U		
C4024	ECHYACADAZEV	50V 2.2U	1	
C4025,26	ECUX1C104ZFV	16V 0.1U	2	
C4027	ECA1CAK100X	16V 10U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C4028	ECUX1C104ZFV	16V 0.1U	1	
C4029	ECA1CAK100X	16V 10U	1	
C4030	ECUX1C104ZFV	16V 0.1U	1	
C4032	ECA1CAK100X	16V 10U	1	
C4034	ECA1CAK100X	16V 10U	1	
C4035	ECJ1VF1H103Z	50V 0.01U	1	
C4036	ECA1CPX221	16V 220U	1	
C4037	ECQB1H103JF	50V 0.01U	1	
C4038	ECA1CPX221	16V 220U	1	
C4039	ECQB1H223JF	50V 0.022U	1	
C4040,41	ECA1CAK220X	16V 22U	2	
C4042	ECQB1H223JF	50V 0.022U	1	
C4043	ECA1CPX102	16V 1000U	1	
C4044	ECA1CAK220X	16V 22U	1	
C4045	ECUV1H330JCV	50V 33P	1	ECJ1VC1H330J
C4046	ECA1CPX102	16V 1000U	1	
C4047	ECQB1H223JF	50V 0.022U	1	
C4048	ECA1CAK220X	16V 22U	1	
C4049	ECQB1H223JF	50V 0.022U	1	
C4050,51	ECA1CPX221	16V 220U	2	
C4052	ECQB1H223JF	50V 0.022U	1	
C4052	ECA1CAK470X	16V 47U	1	
C4054.55	ECUX1C104ZFV	16V 0.1U	2	
C4058	VCEA1CAE470	16V 47P	1	
C4059	ECUX1C104ZFV	16V 0.1U	1	
C4063	VCEA1CAE470		1	
	_	16V 47P		
C4067,68	ECUX1C104ZFV	16V 0.1U	2	
C4069,70	ECQB1H102JF	50V 1000P	2	
C4072,73	ERDS2TJ682	1/4W 6.8K	2	
C4076	ECUX1C104ZFV	16V 0.1U	1	
C4077	ECEA0JKS101	6.3V 100U	1	
C4082	ECEA1HKA4R7	50V 4.7U	1	
C4083	ECUX1C104ZFV	16V 0.1U	1	
C4091	ECUX1C104ZFV	16V 0.1U	1	
C4096	ECEA1CKA100	16V 10U	1	
C4097	ECUV1C104KBV	16V 0.1U	1	ECJ1VB1C104K
C4098	ECA1CAK470X	16V 47U	1	
C4099	ECUX1C104ZFV	16V 0.1U	1	
C4101	ECA0JM471G	6.3V 470U	1	ECA0JM471
C4102-06	ECUX1C104ZFV	16V 0.1U	5	
C4107,08	ECA1CAK470X	16V 47U	2	
C4112	ECA1CPX221	16V 220U	1	
C4153,54	ECUV1H330JCV	50V 33P	2	ECJ1VC1H330J
C4164,65	ECUX1C104ZFV	16V 0.1U	2	
C4167-69	ECUV1H330JCV	50V 33P	3	ECJ1VC1H330J
C4174	ECWM1H101JZ5	50V 100P	1	F0A1H101A017
C4175,76	ECQB1H102JF	50V 1000P	2	
C4177	ECWM1H101JZ5	50V 100P	1	F0A1H101A017
C4178	ECA1CPX221	16V 220U	1	
C4181	ECQB1H223JF	50V 0.022U	1	
C4189,90	VCEA0JAE470B	6.3V 47P	2	F2A0J470A120
C4193	ECA1CAK220X	16V 22U	1	
C7001	ECUX1C104ZFV	16V 0.1U	1	
C7002	ERJ3GEY0R00	1/16W 0	1	
C7003	ECUX1C104ZFV	16V 0.1U	1	
C7004,05	ECUV1H330JCV	50V 33P	2	ECJ1VC1H330J
C7004,00	ECUX1C104ZFV	16V 0.1U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C7007,08	ECEA1CKS101	16V 100U	2	
C7010	ECEA0JKA470	6.3V 47U	1	
C7011,12	ECUV1H101JCV	50V 100P	2	ECJ1VC1H101J
C7301	ECJ1VF1H103Z	50V 0.01U	1	(EG)
C7302	VCEA0JAW101	6.3V 100P	1	
C7303	ECJ1VF1H103Z	50V 0.01U	1	(EB)
C7304	VCEA0JAW101	6.3V 100P	1	,
C7305,06	ECUV1H330JCV	50V 33P	2	ECJ1VC1H330J
C7307	ECJ1VF1H103Z	50V 0.01U	1	
C7308	ECEA1HKA2R2	50V 2.2U	1	
C7311	ERJ3GEY0R00	1/16W 0	1	
C7312,13	ECUX1C104ZFV	16V 0.1U	2	
C7315	ECJ2VB1E104K	25V 0.1U	1	
C7316	ECUX1C104ZFV	16V 0.1U	1	
C7317	VCEA1CAW100	16V 10P	1	F2A1C1000015
C7318	VCEA0JAW470	6.3V 47P	1	F2A0J4700008
C7319,20	VCEA1CAW100	16V 10P	2	F2A1C1000015
C7324,25	ECUX1C104ZFV	16V 0.1U	2	
C7341,42	ECUV1H472KBV	50V 4700P	2	ECJ1VB1H472K
C7402	ECUX1C104ZFV	16V 0.1U	1	
C7402	VCEA1CCB470	16V 47P	1	F2A1C4700024
C7405	ECUV1C104KBV	16V 0.1U	1	ECJ1VB1C104K
C7406	ECA0JM471G	6.3V 470U	1	ECA0JM471
C7400	ECEA1HKA010	50V 1U	1	ECA03W471
C7407	ECUV1H222KBV	50V 2200P	1	ECJ1VB1H222K
C7410	ECUV1C104KBV	16V 0.1U	1	ECJ1VB1H222K
	ECUX1C104KBV		1	ECJ IVB IC 104K
C7415		16V 0.1U		
C7417	ECJ1VF1H103Z	50V 0.01U	1	
C7418	ECEA1CKA470	16V 47U	1	
C7419	ECA1CAK100X	16V 10U	1	
C7420	ECA1HAK2R2X	50V 2.2U	1	
C7421	ECA1CAK100X	16V 10U	1	
C7422	ECA1HAK2R2X	50V 2.2U	1	
C7423	ECQV1H104JL	50V 0.1U	1	
C7424	ECEA0JKS101	6.3V 100U	1	
C7425	ECA1EM101	25V 100U	1	
C7431	ECA1CM331	16V 330U	1	
C7437	ECEA0JKS101	6.3V 100U	1	
C7438	ECUV1H221JCV	50V 220P	1	
C7441	ECJ1VF1H103Z	50V 0.01U	1	
C7442	ECEA0JKA470	6.3V 47U	1	
C7443	ECEA0JKS101	6.3V 100U	1	
C7444	ECJ1VF1H103Z	50V 0.01U	1	
C7501,02	ECUV1H392KBV	50V 3900P	2	ECJ1VB1H392K
C7507	ECUV1H102KBV	50V 1000P	1	ECJ1VB1H102K
C7513,14	ECUV1H221JCV	50V 220P	2	
C7515,16	ECUX1C104ZFV	16V 0.1U	2	
C7517	ECEA1CKS470	16V 47U	1	
C7521	ECJ1VF1H103Z	50V 0.01U	1	
C7523	ECEA1CKS470	16V 47U	1	
C7524	ECEA1CKS330	16V 33U	1	
C7527-30	ECUV1H101JCV	50V 100P	4	ECJ1VC1H101J
C7531	ECUV1H100DCV	50V 10U	1	ECJ1VC1H100D
C7532	ECUX1C104ZFV	16V 0.1U	1	
C7533	ECJ1VF1H103Z	50V 0.01U	1	
C7535,36	ECUV1H220JCV	50V 22P	2	ECJ1VC1H220J

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C7542	ECUX1C104ZFV	16V 0.1U	1	
C7543,44	ECJ1VF1H103Z	50V 0.01U	2	
C7545	ECUX1C104ZFV	16V 0.1U	1	
C7550	ECUV1H120JCV	50V 12P	1	ECJ1VC1H120J
C7551	ECJ1VF1H103Z	50V 0.01U	1	
C7552	ECUV1H100DCV	50V 10U	1	ECJ1VC1H100D
C7554,55	ECUV1H100DCV	50V 10U	2	ECJ1VC1H100D
C7556	ECUX1C104ZFV	16V 0.1U	1	
C7557,58	ECUV1H100DCV	50V 10U	2	ECJ1VC1H100D
C7559	VCEA0JEC471	6.3V 470P	1	F2A0J4710009
C7560	ECJ1VF1H103Z	50V 0.01U	1	
C7561	ECUV1H470JCV	50V 47P	1	
C7562	ECUV1A105ZFV	10V 1U	1	F1H1A105A030
C7563	ECJ1VF1H103Z	50V 0.01U	1	
C7564	ECUV1A105ZFV	10V 1U	1	F1H1A105A030
C7565	ECUV1H471JCV	50V 470P	1	ECJ1VC1H471J
C7566	ECUV1A105ZFV	10V 1U	1	F1H1A105A030
C7567	ECUV1H471JCV	50V 470P	1	ECJ1VC1H471J
C7568	ECUX1C104ZFV	16V 0.1U	1	-
C7569	ECEA0JKS101	6.3V 100U	1	
C7570,71	ECUX1C104ZFV	16V 0.1U	2	
C7572	ECUV1H101JCV	50V 100P	1	ECJ1VC1H101J
C7573	ECUV1H151JCV	50V 150P	1	ECJ1VC1H151J
C7574	ECUV1H200JCV	50V 20P	1	ECJ1VC1H200J
C7575,76	ECEA1EKS4R7	25V 4.7U	2	
C7577	ECEA1CKS100	16V 10U	1	
C7578,79	ECEA1CKA100	16V 10U	2	
C7581	ECUX1C104ZFV	16V 0.1U	1	
C7582,83	ECEA0JKS101	6.3V 100U	2	
C7585	EEVHB1E4R7	25V 4.7U	1	
C7586	ECUV1H101JCV	50V 100P	1	ECJ1VC1H101J
C7587	EEVHB1E4R7	25V 4.7U	1	
C7588	ECUX1C104ZFV	16V 0.1U	1	
C7591	ECJ1VF1H103Z	50V 0.01U	1	
C7592	ECEA0JKS101	6.3V 100U	1	
C7593	VCE0073-T	E.CAPACITOR	1	F4D55473A005
C7594	ECUX1C104ZFV	16V 0.1U	1	
C7598	ECUX1H150JCV	50V 15P	1	ECUV1H150JCV
C7602	ECUV1H472KBV	50V 4700P	1	ECJ1VB1H472K
C7603	ECJ1VF1H103Z	50V 0.01U	1	
C7606	ECJ1VF1H103Z	50V 0.01U	1	
C7607	ECUX1C104ZFV	16V 0.1U	1	
C7608	ECEA0JKS101	6.3V 100U	1	
C7609	ECUX1C104ZFV	16V 0.1U	1	
C7802	ECUV1H472KBV	50V 4700P	1	ECJ1VB1H472K
C7803	ECUV1H392KBV	50V 3900P	1	ECJ1VB1H392K
C7804,05	ECUV1H102KBV	50V 1000P	2	ECJ1VB1H102K
C7804,05	ECA2AHG470	100V 47U	1	250 I TO III IOZK
C7807	ECUX1C104ZFV	16V 0.1U	1	
	ECA1CHG221	16V 0.10	1	
C7811				
C7811	ECUX1C104ZFV	16V 0.1U	1	EC IAVCALIATA I
C7812-57	ECUV1H151JCV	50V 150P	46	ECJ1VC1H151J
C7858	ECUX1C104ZFV	16V 0.1U	1	
C7859	ECEA0JKA470	6.3V 47U	1	E0 141/0411404 /
C7860	ECUV1H101JCV	50V 100P	1	ECJ1VC1H101J
C7861	ECUV1A105ZFV	10V 1U	1	F1H1A1050002
C7862	ECEA0JKA331	6.3V 330U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C7863	ECUX1C104ZFV	16V 0.1U	1	
C7864	ECA2AM100	100V 10U	1	
C7867	ECUV1A105ZFV	10V 1U	1	F1H1A1050002
C7868	ECUV1H102KBV	50V 1000P	1	ECJ1VB1H102K
C7901	F1K3A680A004	1000V 68P	1	
C9901	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C9902	ECUX1C104ZFV	16V 0.1U	1	
C9903	VCEA0JBS470	6.3V 47P	1	F2A0J470A005
C9904	ECUX1C104ZFV	16V 0.1U	1	
D001	S1WBA60S	DIODE	1	B0KA0000014 A
D501	ERA85009	DIODE	1	BUKAUUUUU14
D502	ERA22-04	DIODE	1	B0HAGP000001
D503,04	FCQ10A6	DIODE	2	BUING! UUUU!
D505,04 D505	ERA22-04	DIODE	1	B0HAGP000001
			_	BURAGPUUUUUT
0506	FCH6A10	DIODE	1	DOA A OMOCCOCA
D507,08	ERA91-02	DIODE	2	B0AAGM000001
D511,12	MA165	DIODE	2	MA2C165
D514	MA165	DIODE	1	MA2C165
D515,16	ERA91-02	DIODE	2	B0AAGM000001
D517	MA165	DIODE	1	MA2C165
D0702	ERJ6GEY0R00V	1/10W 0	1	
D3901	MA2C165001VT	DIODE	1	
D3902	MA142WK	DIODE	1	MA3J142E0L
D3903	MA142WA	DIODE	1	MA3Z142D0RG
D3904	MA142WK	DIODE	1	MA3J142E0L
D4001,02	MA2C165001VT	DIODE	2	
D4006,07	MA142WA	DIODE	2	MA3Z142D0RG
D4011	MA142WA	DIODE	1	MA3Z142D0RG
D4018	MA2C165001VT	DIODE	1	
D7001	LNJ201LPQJA	LED(RED)	1	
D7002	ERZVA5V471	DIODE	1	A
D7401	MA4300N-M	DIODE	1	MAZ4300NM
D7501	1SS355	DIODE	1	B0ACCK000005
D7502	MA2C165001VT	DIODE	1	
D7507,08	B0JACE000001	DIODE	2	
D7510	B0EAKL000031	DIODE	1	
D7511	MA2C165001VT	DIODE	1	
D7801,02	MA165TA5	DIODE	2	MA2C16500E
D7803	AU01Z	DIODE	1	B0HAGM000006
D7804,05	MAZ40560MF	DIODE	2	
D7804,03	NSPW310BST	LED(WHITE)	1	B3AFA0000020
D7807	MA4047M	DIODE	1	MAZ40470M
D9901	MA2C165001VT	DIODE	1	
'			+ •	
DP7801	A2BD00000043	DISPLAY TUBE	1	
		-	1	
F001	215 2A	FUSE	1	Δ
FL0001	J0KD0000050	C	1	
FL0002	J0KE00000062	FILTER	1	
FL0003	J0KE00000060	FILTER	1	
FL3001	ELB4A027B	FILTER	1	
FL3002	ELB4E043B	FILTER	1	
FL3003	ELB4B106B	FILTER	1	
FL7301	VLF0633	FILTER	1	J0HACK000008

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
FL7501-03	F1H0J1050018	FILTER	3	
FL7505	F1H0J1050018	FILTER	1	
-V1	EUMP04D2	SWITCHING ASS'Y	1	
C501	AN1432T	IC	1	
C502	SI3120FA	IC	1	
IC503	NJM79M12F	IC	1	
C505	SI3050CA	IC	1	C5HAZHG00001
IC0701	LA75503	IC	1	C1AA00000606
C1502	C0DBCHD00002	IC	1	
C1504	C0DBCHD00002	IC	1	
C1505	PQ1R22	IC	1	C0CBAAC00039
IC1506	C0DBCGD00001	IC	1	
C1507	C0DBCFD00001	IC	1	
C1509	C0DBEZC00010	IC	1	
C1510	C0DBFGB00001	IC	1	
C1511	PQ05DZ1U	IC	1	C0DBZHG00005
IC1513	C0DBCHD00002	IC	1	
IC3002	AN3581S	IC	1	
C3004	C1AB00000791	IC	1	
IC3901	C1AB00001476	IC	1	
IC3902,03	BU4053BCF	IC	2	
IC3904	BA7660FS-E2	IC	1	C9ZB00000282
IC4001	CXA2089Q	IC	1	C1AB00000461
C4002	C0JBAA000115	IC	1	
IC4003	M62420FP	IC	1	C1AB00000820
IC4004	NJM4558M	IC	1	C0ABBB000044
IC4005	HA17431PA	IC	1	C0ZBZ0000361
IC4006,07	NJM4558M	IC	2	C0ABBB000044
IC4010,11	NJM4580M	IC	2	C0ABBB000126
IC4012	NJM2904M	IC	1	C0ABBA000021
IC4015	TC7W04FTE12L	IC	1	C0JBAB000178
IC4016	B3RAE0000023	IC	1	COODADOOTTO
IC7001	NJM4580M	IC	1	C0ABBB000126
IC7301	TDA9874AH	IC	1	C1AB00001404
IC7301	PST7043-T	IC	1	C0EAH0000051
			_	
IC7401	PQ12DZ1U	IC IC	1	COARREDOO044
IC7403	NJM4558M	IC IC	1	C0ABBB000044
IC7404	C0DBCHD00002	IC IC	1	C2EACC002245
IC7502	M24C16-WBN6	IC IC	1	C3EAGC000015
IC7503	C1DB00000274	IC IC	1	COARRAGGGG
IC7504	NJM2904M	IC IC	1	C0ABBA000021
IC7506	M306H1SFP	IC IC	1	C2CBYG000005
C7508	C3FBKC000080	IC IC	1	
C7509	C3BBHC000226	IC	1	
IC7510	JVABA6138	IC	1	C1BA00000060
IC7512	C0EBH0000180	IC	1	
IC7513	C0EBF0000057	IC	1	
C7801	C0HBB0000029	IC	1	
C9901	C0DBCHD00002	IC	1	
C9903	PQ3DZ53U	IC	1	C0DBFGE00002
IP501	ICPN20	IC PROTECTOR	1	A
IP502	ICPN15	IC PROTECTOR	1	Δ
	1		1	1

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
P4001	VSF0015A04	IC PROTECTOR	1	\triangle
P4003,04	VSF0015A04	IC PROTECTOR	2	Δ
P7501	VSF0015A04	IC PROTECTOR	1	Δ
				1
R7001	RPM6937-V11	IR RECEIVER	1	C9ZA00000073
147001	10 HI0007-V11	IK KESEIVEK	<u>'</u>	032A0000010
JK3901	K1U823A00001	LINE OUT,AV4 IN	1	
JK3904	VJS3921-A	AV2(DECORDER)	1	K1FB121A0003
JK3905	VJS3921-A	AV1(TV)	1	K1FB121A0003
JK7001	VJJ0574	S-VIDEO IN JACK	1	K1CB104A0009
JK7002	VJJ0573	V IN,L/MONO-A IN-R	1	K2HA303A0004
K0703	ERJ3GEY0R00	1/16W 0	1	
K 0707	ERJ3GEY0R00	1/16W 0	1	
CO709	ERJ3GEY0R00	1/16W 0	1	
K3001,02	ERJ3GEY0R00	1/16W 0	2	
K3005,06	ERJ3GEY0R00	1/16W 0	2	
K3013	ERJ3GEY0R00	1/16W 0	1	
K3016-21	ERJ3GEY0R00	1/16W 0	6	
K7301-03	ERJ6GEY0R00V	1/10W 0	3	
K7402	ERJ3GEY0R00	1/16W 0	1 -	
K7501-05	ERJ3GEY0R00	1/16W 0	5	
K7509	ERJ3GEY0R00 ERJ3GEY0R00	1/16W 0 1/16W 0	1	
K7512 K7517	ERJ3GEY0R00	1/16W 0	1	
K7517 K7520	ERJ3GEY0R00	1/16W 0	1	
K7520 K7522	ERJ3GEY0R00	1/16W 0	1	
ITTOLL	EROOCETOROO	177070	<u>'</u>	
L001	ELF15N005A	FILTER	1	⚠
L002	ELF15N006A	FILTER	1	Δ
L502	EXCELSR35	FILTER	1	
L503	EXCELDR35V	FILTER	1	
L505	LH8TB100K	FILTER	1	
L506	ECXELDR35V	FILTER	1	
L507	LH8TB100K	FILTER	1	
L508,09	LH8TB150K	FILTER	2	
L516	EXCELSA35	FILTER	1	
L518	EXCELSA35	FILTER	1	
L519-21	EXCELDR35V	FILTER	3	<u></u>
L0701	ELJNAR18JF	COIL	1	(EG)
L0701	ELJNAR22JF	COIL 22UH	1	(EB)
_0703	ELJNA1R8JF	COIL	1	(EB)
L0703	ELJNA2R2JF	COIL	1	(EG)
L3002,03	VLQ0599J220	COIL 22UH	2	G0C220JA0026
2002 02	VLQ0599J220	COIL 22UH	1	G0C220JA0026
_3902,03	VLQ0599J330	COIL 33UH	2	G0C330JA0026
_4002 	VI 00599 11P0	COIL 22UH	1	G0C1R0JA0026
L7302 L7503	VLQ0599J1R0	COIL 22UH	1	G0C1R0JA0026 G0C220JA0026
L7801,02	VLQ0599J220 VLQ0599J220	COIL 22UH	2	G0C220JA0026 G0C220JA0026
-, 00 1,02	V LQ03333220	OOIL ZZOFI		3002200A0020
_B3901-13	J0JGC0000020	COIL	13	
LB3922-24	J0JGC0000020	COIL	3	
LB7001-03	VLP0323A601R	CHIP SOLID INDUCTOR	3	J0JCC0000062
LB7004,05	ERJ3GEYJ101	1/16W 100	2	D0GB101JA002

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
LB7301	ERJ6GEY0R00V	1/10W 0	1	
LB7303	ERJ6GEY0R00V	1/10W 0	1	
LB7401	J0JHC0000032	CHIP INDUCTOR	1	
LB7404-06	J0JHC0000032	CHIP INDUCTOR	3	
LB7409	J0JHC0000032	CHIP INDUCTOR	1	
LB7501,02	J0JHC0000032	CHIP INDUCTOR	2	
LB7504	ERJ3GEY0R00	1/16W 0	1	
LB7505,06	J0JGC0000020	COIL	2	
LB7801,02	ERJ3GEY0R00	1/16W 0	2	
LB9901,02	J0JHC0000046	CHIP SOLID INDUCTOR	2	
LB9903-05	J0JGC0000020	COIL	3	
LB9906,07	J0JHC0000046	CHIP SOLID INDUCTOR	2	
	000110000040	GIIII GGEID INDGGIGIN		
MC502	EUML40F2	DC-DC CONVERTER	1	
1110002	LOME-FOI 2	DO-DO GONVERVER	<u> </u>	
P1101	HSC0525	AC INLET	1	Δ
1 1101	11000323	AO INCET		\(\frac{1}{12}\)
P1290	B4B-EH-A	CONNECTOR(4P)	1	
P1291	VJS4420Z004	CONNECTOR 4P	1	K1ZZ00001115
P7001	K1MN20A00052	CONNECTOR 20P	1	
P7501	K1MN18A00041	CONNECTOR 18P	1	
P7503	VJP3233A003	CONNECTOR 3P	1	K1KA03A00086
P7504	K1MN20A00052	CONNECTOR 20P	1	
P7801	K1MN18A00041	CONNECTOR 18P	1	
P7802	K1KA05A00224	CONNECTOR 5P	1	
P7901	K1KB05C00004	CONNECTOR 5P	1	
PC1	RPG5636	PACKING CASE	1	(EG)
PC1	RPG5791	PACKING CASE	1	(EB)
PK0701	VJR0826E009W	CONNECTOR 9P	1	K1MR09A00028
PK7301	VJR0777B007W	CONNECTOR 7P	1	K1MM07B00002
PK7302	VJR0777B006W	CONNECTOR 6P	1	K1MM06B00002
PP0701	VJP3589E004B	CONNECTOR(MALE) 4P	1	K1KA04B00135
PP3001	VJP3042G018W	CONNECTOR(MALE) 18P	1	K1KA18A00041
PP3002	VJP3042G014W	CONNECTOR(MALE) 14P	1	K1KA14A00098
PP3003	VJP3042G011W	CONNECTOR(MALE) 11P	1	K1KA11A00049
PP4001	VJP3042G018W	CONNECTOR(MALE) 18P	1	K1KA18A00041
PP7403	VJP3042G017W	CONNECTOR(MALE) 17P	1	K1KA17A00011
PP9901	K1KAA0A00095	CONNECTOR(MALE) 100P	1	
PP9902	VJP4357B019B	CONNECTOR(MALE) 19P	1	K1KA19Z00001
			+ '	
PS1290	TWGP19XA1	CONNECTOR(19P)	1	
PS3901	VJS3042F018W	CONNECTOR(FEMALE) 18P	1	K1KB18B00012
PS3902	VJS3042F014W	CONNECTOR(FEMALE) 14P	1	K1KB14B00018
PS3902 PS3903	VJS3042F014W	CONNECTOR(FEMALE) 11P	1	K1KB11B00013
PS3905	VJS3042F017W	CONNECTOR(FEMALE) 17P	1	K1KB17B00013
		, ,	1	
PS3907	VJS3042F018W	CONNECTOR(FEMALE) 18P	1	K1KB18B00012
O501	28C3344AB	TRANSISTOR	4	
Q501	2SC3311AR	TRANSISTOR	1	
Q502	2SD2000	TRANSISTOR	1	
Q503	2SA1309AR	TRANSISTOR	1	
Q504	2SC3311AR	TRANSISTOR	1	
Q0702	2SD601ASTX	TRANSISTOR	1	2SD0601ASL
Q3001-05	2SB1218A	TRANSISTOR	5	
Q3901,02	2SB1218A	TRANSISTOR	2	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
Q3905	2SD1328-R	TRANSISTOR	1	2SD13280R
Q3906	2SB710A	TRANSISTOR	1	2SB0710A
Q3907	2SD1819ATX	TRANSISTOR	1	2SD1819AWL
Q3908	2SB1218A	TRANSISTOR	1	2001010/412
Q3909,10	2SD1328-R	TRANSISTOR	2	2SD13280R
Q4003	2SD1992A-R	TRANSISTOR	1	2SD1992ARA
Q4004	2SK170BL	TRANSISTOR	1	ZOD 100ZAICA
Q4005	2SB709A	TRANSISTOR	1	2SB0709A
Q4006	2SD1994A	TRANSISTOR	1	2SD1994AHA
Q4007	2SD601A-R	TRANSISTOR	1	2SD0601AR
Q4008	2SB709A	TRANSISTOR	1	2SB0709A
Q4009,10	2SD1328-R	TRANSISTOR	2	2SD13280R
Q4003,10	2SD1328-R	TRANSISTOR	1	2SD13280R
Q4017	2SB1321A	TRANSISTOR	1	2001020010
Q4019,20	2SD1328-R	TRANSISTOR	2	2SD13280R
Q4010,20	2SB1218A	TRANSISTOR	1	2001020010
Q4021 Q4022	2SD1994A	TRANSISTOR	1	2SD1994AHA
Q4022 Q4024	2SD1394A 2SD1328-R	TRANSISTOR	1	2SD1334AHA 2SD13280R
Q4024 Q4025	2SB709A	TRANSISTOR	1	2SB0709A
Q4025 Q4026	2SD601A-R	TRANSISTOR	1	2SD0601AR
			1	
Q4028 Q4029	2SB709A 2SJ74BL	TRANSISTOR	1	2SB0709A B1CCBC000002
			-	B1CCBC000002
Q4030	2SB1322A	TRANSISTOR	1	
Q7402	2SB1218A	TRANSISTOR	1	
Q7407	2SB1218A	TRANSISTOR	1	00040000
Q7408,09	2SD1328-S	TRANSISTOR	2	2SD13280S
Q7501,02	2SD601A-R	TRANSISTOR	2	2SD0601AR
Q7503	2SD1819ATX	TRANSISTOR	1	2SD1819A0L
Q7505	2SD1119	TRANSISTOR	1	2SD11190L
Q7506	2SB710	TRANSISTOR	1	2SB0710
Q7507	2SB709A	TRANSISTOR	1	2SB0709A
Q7508	2SC2295-B	TRANSISTOR	1	2SC22950B
Q7511	2SD601A-R	TRANSISTOR	1	2SD0601AR
Q7512	2SD1819ATX	TRANSISTOR	1	2SD1819A0L
Q7513	2SD601A-R	TRANSISTOR	1	2SD0601AR
Q7514	2SD1819ATX	TRANSISTOR	1	2SD1819A0L
Q7515	2SD601A-R	TRANSISTOR	1	2SD0601AR
Q7801	2SD1992A-R	TRANSISTOR	1	2SD1992ARA
Q7802	2SD601A-R	TRANSISTOR	1	2SD0601AR
Q7803	2SB710A	TRANSISTOR	1	2SB0710A
Q7804-08	2SD601A-R	TRANSISTOR	5	2SD0601AR
QR1501	UN5212-TX	TRANSISTOR	1	UNR521200L
QR3901-06	UN5212-TX	TRANSISTOR	6	UNR521200L
QR3907	UN5114	TRANSISTOR	1	UNR5114
QR3908	UN5212-TX	TRANSISTOR	1	UNR521200L
QR3909	UN5211	TRANSISTOR	1	UNR5211
QR4001-05	UN5211	TRANSISTOR	5	UNR5211
QR4006	UN5113	TRANSISTOR	1	UNR5113
QR7001	UN5213	TRANSISTOR	1	UNR521300L
QR7404	UN5212-TX	TRANSISTOR	1	UNR521200L
QR7501	UN5212-TX	TRANSISTOR	1	UNR521200L
QR7801	UN5213	TRANSISTOR	1	UNR521300L
QR7802	UN5112	TRANSISTOR	1	UNR5112
QR7803	UN5213	TRANSISTOR	1	UNR521300L
QR7804	UN5112	TRANSISTOR	1	UNR5112

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R001	ERDS1TJ474	1/2W 470K	1	
R002	ERDS1FJ273	0.5W 27K	1	ERDS1TJ273
R003-05	ERDS1FJ183	1/2W 18K	3	
R501	ERG1SJ391	1W 390	1	
R502	ERDS1FJ271	0.5W 270	1	
R503	ERDS2FJ223	1/4W 22K	1	
R504,05	ERX1SJR22	1W 0.22	2	
R506	ER0S2CHF1800	0.25W 180	1	
R507	ER0S2TKF4870	1/4W 487	1	
R508	ERDS2FJ222	1/4W 2.2K	1	ERDS2TJ222
R509	ERDS2FJ102	1/4W 1K	1	
R510	ER0S2TKF1271	1/4W 1270	1	EROS2TKF1271
R512	ERX1SJR22	1W 0.22	1	
R514	ERDS2FJ222	1/4W 2.2K	1	ERDS2TJ222
R515	ERDS2FJ821	1/4W 820	1	ERDS2TJ821
R516	ERDS2FJ222	1/4W 2.2K	1	ERDS2TJ222
R517	ERDS2FJ471	1/4W 470	1	
R518	ERDS2FJ332	1/4W 3.3K	1	
R519	ERDS2FJ472	1/4W 4.7K	1	ERDS2TJ472
R520	ERX1SJR22	1W 0.22	1	
R521	ERDS2FJ222	1/4W 2.2K	1	ERDS2TJ222
R522	ERDS2FJ101	1/4W 100	1	
R523	ERX1SJR22	1W 0.22	1	
R524	ERDS2FJ101	1/4W 100	1	
R525	ERDS2FJ100	1/4W 10	1	
R526	ERDS2FJ101	1/4W 100	1	
R527	ERDSKTJ222	0.25W 2.2K	1	
R528	ERX1SJR22	1W 0.22	1	
R529	ERDS2FJ101	1/4W 100	1	
R530	ERDS2FJ471	1/4W 470	1	
R531,32	ERDS2FJ102	1/4W 1K	2	
R534	ER0S2TKF2800	1/4W 280	1	
R535,36	ERDS1FJ271	0.5W 270	2	
•	ER0S2TKF8060		1	
R537		0.25W 806	1	(ED)
R0701	ERJ6GEYG104	1/10W 100K	_	(EB)
R0705	ERJ3GEYJ472	1/16W 4.7K	1	
R0707	ERJ3GEYJ393	1/16W 39K	1	
R0708	ERJ3GEYJ103	1/16W 10K	1	
R0711	ERJ3GEYJ181	1/16W 180	1	
R0713	ERJ3GEY0R00	1/16W 0	1	
R0715	ERJ3GEYJ223	1/16W 22K	1	
R0717	ERJ3GEYJ471	1/16W 470	1	
R0719	ERJ3GEYJ472	1/16W 4.7K	1	
R0725	ERJ6GEYJ101V	1/10W 100	1	ERJ6GEYJ101A
R0727	ERJ3GEY0R00	1/16W 0	1	
R0728	ERJ3GEY0R00	1/16W 0	1	(EB)
R0729	ERJ3GEYJ103	1/16W 10K	1	
R0730	ERJ6GEYG103	1/10W 10K	1	(EG)
R0740	ERJ3GEYG471	1/16W 470	1	
R0741	ERJ3GEYJ221	1/16W 220	1	
R0742	ERJ8GEYJ151	1/8W 150	1	
R0745	ERJ6GEYJ335	1/10W 3.3M	1	
R1501	ERJ3GEYJ222	1/16W 2.2K	1	
R1504	ERDS1TJ180	1/2W 18	1	
R1505	ERJ3GEYJ102	1/16W 1K	1	
R1510	ERJ3GEYF103	1/16W 10K	1	
R1511	ERJ3GEYJ392	1/16W 3.9K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R1512	ERJ3GEYF823	1/16W 82K	1	
R1515	ERDS2FJ221	1/4W 220	1	
R3003	ERJ3GEYJ102	1/16W 1K	1	
R3004	ERJ3GEYJ103	1/16W 10K	1	
R3005	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R3006,07	ERJ3GEYJ561	1/16W 560	2	
R3008	ERJ3GEYJ272	1/16W 2.7K	1	
R3009	ERJ3GEYJ330	1/16W 33	1	
R3010	ERJ3GEYJ681	1/16W 680	1	
R3011	ERJ3GEYJ103	1/16W 10K	1	
R3012-14	ERJ3GEYJ102	1/16W 1K	3	
R3015	ERJ3GEYJ471	1/16W 470	1	
R3016	ERJ3GEYJ103	1/16W 10K	1	
R3017	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R3019	ERJ3GEYJ331	1/16W 330	1	
R3020,21	ERJ3GEYJ561	1/16W 560	2	
R3022	ERJ3GEYJ103	1/16W 10K	1	
R3023	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R3025	ERJ3GEYJ331	1/16W 330	1	
R3026	ERJ3GEYJ561	1/16W 560	1	
R3027	ERJ3GEYJ103	1/16W 10K	1	
R3028	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R3030	ERJ3GEYJ331	1/16W 330	1	500510107002
R3032-35	ERJ3GEYJ221	1/16W 220	4	
R3036	ERJ3GEYJ223	1/16W 22K	1	
R3037	ERJ3GEYJ271	1/16W 270	1	
R3038	ERJ3GEYJ103	1/16W 10K	1	
R3041	ERJ3GEYJ223	1/16W 22K	1	
R3901	ERJ3GEYJ750	1/16W 75	1	
R3902		1/16W 10K	1	
	ERJ3GEYJ103	1/16W 75	2	
R3903,04	ERJ3GEYJ750			ED ISDEDZENV
R3905,06	ERJ3RED750	1/16W 75	2	ERJ3RED750V
R3907	ERJ3GEYJ103	1/16W 10K	1	
R3908,09	ERJ6GEYJ471	1/10W 470	2	
R3910	ERJ3RBD151	1/16W 150	1	
R3911,12	ERJ3GEYJ222	1/16W 2.2K	2	
R3913	ERJ3RBD181	1/16W 180	1	
R3914	ERJ3RBD151	1/16W 150	1	
R3915,16	ERJ3GEYJ101	1/16W 100	2	D0GB101JA002
R3917,18	ERJ3GEYJ102	1/16W 1K	2	
R3919	ERJ3RBD151	1/16W 150	1	
R3920	ERJ3RBD121	1/16W 120	1	ERJ3RBD121V
R3921	ERJ3RED750	1/16W 75	1	ERJ3RED750V
R3922,23	ERJ3GEYJ101	1/16W 100	2	D0GB101JA002
R3924	ERDS2FJ471	1/4W 470	1	
R3925-28	ERJ3GEYJ750	1/16W 75	4	
R3929,30	ERJ3GEYJ101	1/16W 100	2	D0GB101JA002
R3931-34	ERJ3RED750	1/16W 75	4	ERJ3RED750V
R3935	ERJ3GEYJ750	1/16W 75	1	
R3936,37	ERJ3GEYJ472	1/16W 4.7K	2	
R3938	ERJ3GEYJ473	1/16W 47K	1	
R3939	ERJ3GEYJ472	1/16W 4.7K	1	
R3940	ERJ3GEYJ103	1/16W 10K	1	
R3941	ERJ3GEYJ153	1/16W 15K	1	
R3942	ERJ3GEYJ472	1/16W 4.7K	1	
R3943	ERDS2FJ471	1/4W 470	1	
R3944	ERJ3GEYJ472	1/16W 4.7K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R3945	ERJ3GEYJ392	1/16W 3.9K	1	
R3946	ERJ3RBD151	1/16W 150	1	
R3947	ERJ3RBD333	1/16W 33K	1	
R3948	ERJ3RBD562	1/16W 5.6K	1	
R3949	ERJ3RBD333	1/16W 33K	1	
R3950	ERJ3RBD562	1/16W 5.6K	1	
R3951	ERJ3RBD333	1/16W 33K	1	
R3952	ERJ3RBD562	1/16W 5.6K	1	
R3953	ERJ3RBD333	1/16W 33K	1	
R3954	ERJ3RBD562	1/16W 5.6K	1	
R3955	ERJ3RBD333	1/16W 33K	1	
R3956	ERJ3RBD562	1/16W 5.6K	1	
R3957	ERJ3RBD333	1/16W 33K	1	
R3958	ERJ3RBD562	1/16W 5.6K	1	
R3959	ERJ3RBD333	1/16W 33K	1	
R3960	ERJ3RBD562	1/16W 5.6K	1	
R3962	ERJ3GEYJ103	1/16W 10K	1	
R3967	ERJ3GEYJ103	1/16W 10K	1	
R3968	ERJ3GEYJ680	1/16W 68	1	ERJ3GEYJ680V
R3969	ERJ3GEYJ472	1/16W 4.7K	1	
R3971	ERJ3RED750	1/16W 75	1	ERJ3RED750V
R3972-74	ERJ3GEYJ103	1/16W 10K	3	LIGOREDIOOV
R3975,76	ERJ3GEYJ101	1/16W 100	2	D0GB101JA002
R3977,78	ERJ3GEYJ103	1/16W 10K	2	D00B1013A002
R3979,80	ERJ6GEYJ471	1/10W 470	2	
R3981,82	ERJ3GEYJ821	1/16W 820	2	
R3983,84	ERJ3GEYJ104	1/16W 100K	2	
-			1	
R3985	ERJ3RBD472	1/16W 4.7K		
R3986,87	ERJ3RBD122	1/16W 1.2K	2	
R3991	ERJ3RBD122	1/16W 1.2K	1	
R4003,04	ERJ6GEY0R00V	1/10W 0	2	
R4007	ERJ3GEY0R00	1/16W 0	1	
R4009,10	ERJ3GEYJ221	1/16W 220	2	
R4011,12	ERJ3GEYJ102	1/16W 1K	2	
R4014	ERJ3GEY0R00	1/16W 0	1	
R4015	ERJ6RED330	1/10W 33	1	
R4016	ERJ6RED100	1/10W 10	1	
R4017-20	ERJ3GEY0R00	1/16W 0	4	
R4023,24	ERJ3GEY0R00	1/16W 0	2	
R4027,28	ERJ3GEY0R00	1/16W 0	2	
R4029	ERJ6GEYG821	1/10W 820	1	
R4031	ERJ6GEYG821	1/10W 820	1	
R4032	ERJ3GEYJ821	1/16W 820	1	
R4033	ERJ3GEYJ221	1/16W 220	1	
R4036	ERJ3GEYJ221	1/16W 220	1	
R4037	ERJ3RBD472	1/16W 4.7K	1	
R4038	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R4039	ERJ3RBD472	1/16W 4.7K	1	
R4040	ERJ3GEYJ271	1/16W 270	1	
R4041	ERJ3RBD681	1/16W 680	1	
R4043	ERJ3GEYJ105	1/16W 1M	1	
R4044	ERJ6GEYF822	1/10W 8.2K	1	
R4045	ERJ3RBD332	1/16W 3.3K	1	
R4046	ERJ6GEYG272	1/10W 2.7K	1	
R4048	ERJ6GEYG392	1/10W 3.9K	1	
R4049	ERJ3GEYJ331	1/16W 330	1	
R4050	ERJ3RBD683	1/16W 68K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R4051	ERJ3RBD473	1/16W 47K	1	
R4052	ERJ3GEYJ153	1/16W 15K	1	
R4053	ERJ3GEYJ682	1/16W 6.8K	1	
R4054	ERDS2FJ2R2	1/4W 2.2	1	ERDS2TJ2R2
R4055	ERJ3GEYJ153	1/16W 15K	1	
R4056	ERJ3GEYJ682	1/16W 6.8K	1	
R4057	ERJ3GEYJ681	1/16W 680	1	
R4058	ERDS2FJ2R2	1/4W 2.2	1	ERDS2TJ2R2
R4059	ERJ3GEYJ681	1/16W 680	1	
R4060	ERJ3RBD473	1/16W 47K	1	
R4061	ERJ3RBD683	1/16W 68K	1	
R4062	ERJ3GEYJ821	1/16W 820	1	
R4063,64	ERJ6GEYG221	1/10W 220	2	
R4065	ERJ6RBD102	1/10W 1K	1	
R4066	ERJ3GEY0R00	1/16W 0	1	
R4067	ERJ6RBD332	1/10W 3.3K	1	
R4068	ERJ6GEYG330	1/10W 33	1	
R4069	ERJ6RED100	1/10W 10	1	
R4070,71	ERJ3GEYJ222	1/16W 2.2K	2	
R4072	ERJ3GEYJ332	1/16W 3.3K	1	
R4073	ERJ6RBD102	1/10W 1K	1	
R4075	ERJ6RBD332	1/10W 3.3K	1	
R4076	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R4077	ERJ6GEYG331	1/10W 330	1	
R4078	ERJ3GEYJ103	1/16W 10K	1	
R4079	ERJ3GEYJ562	1/16W 5.6K	1	
R4080	ERJ3GEYJ223	1/16W 22K	1	
R4081	ERJ3GEYJ333	1/16W 33K	1	
R4082	ERJ3GEYJ103	1/16W 10K	1	
R4083	ERJ3GEYJ562	1/16W 5.6K	1	
R4084	ERJ3GEYJ223	1/16W 22K	1	
R4085	ERJ3GEYJ333	1/16W 33K	1	
R4086	ERJ3GEYJ103	1/16W 10K	1	
R4087	ERJ3GEYJ562	1/16W 5.6K	1	
R4088	ERJ3GEYJ223	1/16W 22K	1	
R4089	ERJ3GEYJ333	1/16W 33K	1	
R4090	ERJ3GEYJ103	1/16W 10K	1	
R4091	ERJ3GEYJ562	1/16W 5.6K	1	
R4092	ERJ3GEYJ223	1/16W 22K	1	
R4093	ERJ3GEYJ333	1/16W 33K	1	
R4100,01	ERJ3GEY0R00	1/16W 0	2	
R4103,04	ERJ3GEY0R00	1/16W 0	2	
R4106	ERJ3GEY0R00	1/16W 0	1	
R4107,08	ERJ3GEYJ821	1/16W 820	2	
R4109,10	ERJ6GEY0R00V	1/10W 0	2	
R4138,39	ERJ3GEYJ103	1/16W 10K	2	
R4143	ERJ3GEYJ103	1/16W 10K	1	
R4144	ERJ3GEYJ223	1/16W 22K	1	
R4145	ERJ3GEYJ473	1/16W 47K	1	
R4146,47	ERJ3GEYJ104	1/16W 100K	2	
R4155	ERJ3GEY0R00	1/16W 0	1	
R4190	ERJ3GEY0R00	1/16W 0	1	
R4191	ERJ6GEYG331	1/10W 330	1	
R4192	ERJ3GEYJ332	1/16W 3.3K	1	
R4193	ERJ6GEYG392	1/10W 3.9K	1	
R4194	ERJ6GEYG272	1/10W 2.7K	1	
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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R4196	ERJ3RBD222	1/16W 2.2K	1	
R4197,98	ERJ3RBD473	1/16W 47K	2	
R4199	ERJ3GEYJ331	1/16W 330	1	
R4200,01	ERJ3RBD473	1/16W 47K	2	
R4202	ERJ3GEYJ473	1/16W 47K	1	
R4203	ERJ3RBD392	1/16W 3.9K	1	
R4204	ERJ3GEYJ151	1/16W 150	1	
R4205	ERJ3GEYJ333	1/16W 33K	1	
R4206	ERJ3GEYJ103	1/16W 10K	1	
R4207	ERJ3RBD822	1/16W 8.2K	1	
R4208	ERJ3RBD102	1/16W 1K	1	
R4209	ERJ3RBD822	1/16W 8.2K	1	
R4211	ERJ3RBD681	1/16W 680	1	
R4213	ERJ3GEYJ105	1/16W 1M	1	
R4214	ERJ3RBD332	1/16W 3.3K	1	
R4215	ERJ3GEY0R00	1/16W 0	1	
R4222	ERJ3GEYJ223	1/16W 22K	1	
R4224	ERJ3GEYJ223	1/16W 22K	1	+
R4225	ERJ3GEYJ104	1/16W 100K	1	+
R4226	ERJ3GEYJ103	1/16W 10K	1	+
R7001	ERJ3GEYJ391	1/16W 390	1	D0GB391JA002
R7001	ERDS2FJ330	1/4W 33	1	20020010A002
R7002 R7003	ERJ3RBD122	1/16W 1.2K	1	
R7003	ERJ3RBD152	1/16W 1.5K	1	
R7004 R7005	ERJ3RBD192	1/16W 2.2K	1	
R7005	ERJ3RBD122	1/16W 1.2K	1	
			1	
R7007	ERJ3GEYJ103	1/16W 10K	1	
R7008	ERJ3GEY0R00	1/16W 0		
R7010-12	ERJ3GEYJ750	1/16W 75	3	
R7013	ERJ3GEYJ103	1/16W 10K	1	
R7014	ERJ3GEYJ562	1/16W 5.6K	1	
R7015	ERJ3GEYJ223	1/16W 22K	1	
R7016	ERJ3GEYJ333	1/16W 33K	1	
R7017	ERJ3GEYJ103	1/16W 10K	1	
R7018	ERJ3GEYJ562	1/16W 5.6K	1	
R7019	ERJ3GEYJ223	1/16W 22K	1	
R7020	ERJ3GEYJ333	1/16W 33K	1	
R7302	ERJ3GEY0R00	1/16W 0	1	
R7305,06	ERJ6GEYJ101V	1/10W 100	2	ERJ6GEYJ101A
R7316	ERJ3GEYJ103	1/16W 10K	1	
R7324	ERJ3GEYJ221	1/16W 220	1	
R7325	ERJ3GEY0R00	1/16W 0	1	
R7327	ERJ3GEYJ822	1/16W 8.2K	1	
R7328,29	ERJ3GEYJ221	1/16W 220	2	
R7401-04	ERJ3GEY0R00	1/16W 0	4	
R7414	ERJ3GEYJ681	1/16W 680	1	
R7415	ERJ3GEYJ151	1/16W 150	1	
R7421	ERDS2FJ561	1/4W 560	1	
R7426,27	ERJ3GEYJ221	1/16W 220	2	
R7432,33	ERJ3GEYJ101	1/16W 100	2	D0GB101JA002
R7434	ERDS2FJ561	1/4W 560	1	
R7439	ERJ3GEYJ151	1/16W 150	1	
R7440	ERJ3GEYJ562	1/16W 5.6K	1	
R7445	ERJ3GEYJ682	1/16W 6.8K	1	
R7446	ERJ3GEYJ222	1/16W 2.2K	1	
R7447,48	ERJ3GEYJ154	1/16W 150K	2	
R7449	ERJ3GEYJ682	1/16W 6.8K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R7450	ERJ3GEYJ222	1/16W 2.2K	1	
R7451,52	ERJ3GEYJ154	1/16W 150K	2	
R7455	ERJ3GEY0R00	1/16W 0	1	
R7456,57	ERJ3GEYJ154	1/16W 150K	2	
R7458	ERJ3GEYJ182	1/16W 1.8K	1	
R7459	ERJ3GEYJ104	1/16W 100K	1	
R7501,02	ERJ3GEYJ221	1/16W 220	2	
R7503,04	ERJ3GEYJ223	1/16W 22K	2	
R7505,06	ERJ3GEYJ103	1/16W 10K	2	
R7507	ERJ3GEYJ472	1/16W 4.7K	1	
R7508	ERJ3GEYJ103	1/16W 10K	1	
R7509	ERJ3GEYJ473	1/16W 47K	1	
R7518	ERJ3GEYJ472	1/16W 4.7K	1	
R7519	ERJ3GEYJ473	1/16W 47K	1	
R7520	ERJ3GEYJ273	1/16W 27K	1	
R7521	ERJ3GEYJ225	1/16W 2.2K	1	
R7522	ERJ3GEYJ224	1/16W 220K	1	
R7523	ERJ3GEYJ104	1/16W 100K	1	
R7524	ERJ3GEYJ221	1/16W 220	1	
R7525	ERJ3GEYJ104	1/16W 100K	1	
R7529	ERJ3GEYJ472	1/16W 4.7K	1	
R7530	ERJ3GEYJ223	1/16W 22K	1	
R7531-33	ERJ3GEYJ101	1/16W 100	3	D0GB101JA002
R7534,35	ERJ3GEYJ102	1/16W 1K	2	200210104002
R7536	ERJ3GEYJ153	1/16W 15K	1	
			1	
R7537	ERJ3GEYJ682	1/16W 6.8K	_	
R7538	ERJ3GEYJ153	1/16W 15K	1	
R7542	ERJ3GEYJ472	1/16W 4.7K	1	
R7545,46	ERJ3GEYJ472	1/16W 4.7K	2	
R7547-52	ERJ3GEYJ101	1/16W 100	6	D0GB101JA002
R7554-62	ERJ3GEYJ101	1/16W 100	9	D0GB101JA002
R7563	ERJ3GEYJ561	1/16W 560	1	
R7564,65	ERJ3GEYJ472	1/16W 4.7K	2	
R7566	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R7567-69	ERJ3GEYJ472	1/16W 4.7K	3	
R7570	ERJ3GEY0R00	1/16W 0	1	
R7571	ERJ3GEYJ393	1/16W 39K	1	
R7572	ERJ3GEY0R00	1/16W 0	1	
R7592	ERJ3GEYJ472	1/16W 4.7K	1	
R7593	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R7594	ERJ3GEYJ472	1/16W 4.7K	1	
R7595	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R7596	ERJ3GEYJ221	1/16W 220	1	
R7597,98	ERJ3GEYJ472	1/16W 4.7K	2	
R7599	ERJ3GEYJ473	1/16W 47K	1	
R7600	ERJ3GEYJ102	1/16W 1K	1	
R7601	ERJ3GEYJ511	1/16W 510	1	
R7602	ERJ3GEYJ471	1/16W 470	1	
R7603,04	ERJ3GEYJ511	1/16W 510	2	
R7605	ERJ3GEYJ102	1/16W 1K	1	
R7606	ERJ3GEYJ472	1/16W 4.7K	1	
R7607	ERJ3GEYJ182	1/16W 1.8K	1	
R7608	ERJ3GEYJ103	1/16W 10K	1	
R7609	ERJ3GEYJ333	1/16W 33K	1	
R7610-13	ERJ3GEY0R00	1/16W 0	4	
R7614	ERJ3GEYJ103	1/16W 10K	1	
11.017	L13000L 10 100	I/ IUIT IUIX	1	1

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R7617	ERJ3GEYJ103	1/16W 10K	1	
R7624	ERJ3GEYJ104	1/16W 100K	1	
R7625	ERJ3GEYJ102	1/16W 1K	1	
R7626	ERJ3GEYJ104	1/16W 100K	1	
R7627	ERJ3GEYJ392	1/16W 3.9K	1	
R7628	ERJ3GEYJ102	1/16W 1K	1	
R7629	ERJ3GEYJ104	1/16W 100K	1	
R7630	ERJ3GEYG153	1/16W 15K	1	
R7631	ERJ3GEYG152	1/16W 1.5K	1	
R7632	ERJ3GEYG562	1/16W 5.6K	1	
R7634	ERJ3GEYJ472	1/16W 4.7K	1	
R7635	ERJ3GEYJ181	1/16W 180	1	
R7636	ERJ3GEYJ472	1/16W 4.7K	1	
R7638	ERJ3GEYJ472	1/16W 4.7K	1	
R7644	ERJ3GEYJ101	1/16W 100	1	D0GB101JA002
R7645	ERJ3GEYJ223	1/16W 22K	1	D0GB1013A002
R7646		1/16W 15K	1	
R7647	ERJ3GEYJ153	1/16W 13K	1	
	ERJ3GEYJ221		1	
R7648	ERJ3GEYJ472	1/16W 4.7K 1/16W 8.2K		
R7649-51	ERJ3RBD822		3	
R7652	ERJ3GEY0R00	1/16W 0	1	
R7657	ERJ3GEYJ103	1/16W 10K	1	
R7659	ERJ3GEYG393	1/16W 39K	1	
R7660	ERJ3GEYG433	1/16W 43K	1	
R7801	ERJ3GEYJ392	1/16W 3.9K	1	
R7802	ERDS2FJ221	1/4W 220	1	
R7803	ERJ3GEYJ331	1/16W 330	1	
R7804,05	ERJ3GEYJ102	1/16W 1K	2	
R7806,07	ERJ3GEYJ103	1/16W 10K	2	
R7808	ERJ3GEYJ303	1/16W 30K	1	
R7809	ERJ3GEYJ114	1/16W 110K	1	
R7810	ERJ3GEYJ103	1/16W 10K	1	
R7811	ERJ3GEYJ682	1/16W 6.8K	1	
R7812-15	ERJ3GEYJ683	1/16W 68K	4	
R7816	ERJ3GEYJ472	1/16W 4.7K	1	
R7817-19	ERJ3GEY0R00	1/16W 0	3	
R7820	ERJ3RBD273	1/16W 27K	1	
R7821	ERDS2FJ151	1/4W 150	1	
R7822	ERJ3RBD332	1/16W 3.3K	1	
R7823	ERJ3RBD562	1/16W 5.6K	1	
R7824	ERJ3RBD222	1/16W 2.2K	1	
R7825	ERJ3RBD332	1/16W 3.3K	1	
R7826	ERJ3RBD562	1/16W 5.6K	1	
R7827	ERJ3RBD113	1/16W 11K	1	
R7828	ERJ3RBD333	1/16W 33K	1	
R7829	ERJ3RBD113	1/16W 11K	1	
R7830	ERJ3RBD122	1/16W 1.2K	1	
R7831	ERJ3RBD152	1/16W 1.5K	1	
R7832	ERJ3RBD222	1/16W 2.2K	1	
R7833	ERJ3RBD332	1/16W 3.3K	1	
R7834	ERJ3RBD562	1/16W 5.6K	1	
R7835	ERJ3RBD113	1/16W 11K	1	
R7836	ERJ3RBD333	1/16W 33K	1	
R7839	ERJ3RBD152	1/16W 1.5K	1	
R7840-43	ERJ3GEYJ103	1/16W 10K	4	
	t	4/4004/0016	+ 4	1
R7845	ERJ3RBD333	1/16W 33K	1	

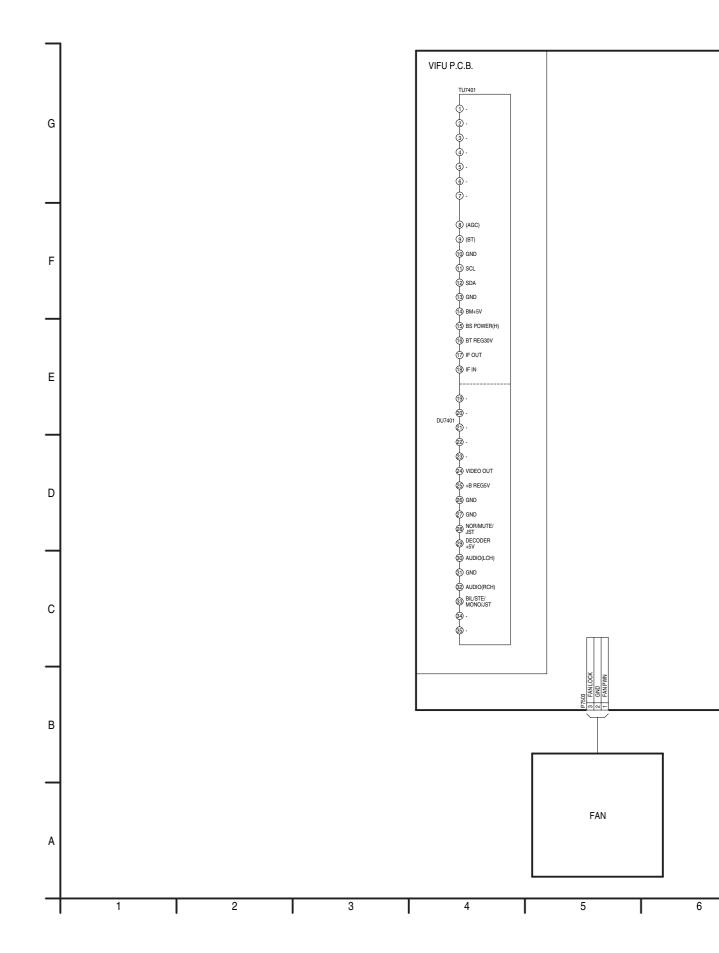
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
RX7501-06	VRE0219A101	RESISTOR-RESISTOR	6	
S7001	EVQ11G07K	SWITCH,POWER	1	
S7001	EVQ11G07K		1	
		SWITCH,CH UP SWITCH,REC MODE	1	
S7005	EVQ11G07K	•		
S7006	EVQ11G07K	SWITCH,EXT LINK	1	
S7007	EVQ11G07K	SWITCH,REC	1	
S7008	EVQ11G07K	SWITCH,TIMER REC	1	
S7009	EVQ11G07K	SWITCH,CH DOWN	1	
S7801	EVQ11G07K	SWITCH,PAUSE	1	
S7802	EVQ11G07K	SWITCH,SKIP F	1	
S7803	EVQ11G07K	SWITCH,STOP	1	
S7804	EVQ11G07K	SWITCH,PLAY	1	
S7805	EVQ11G07K	SWITCH,SKIP R	1	
S7806	EVQ11G07K	SWITCH,SEARCH R	1	
S7807	EVQ11G07K	SWITCH,DOWN	1	
S7808	EVQ11G07K	SWITCH,UP	1	
S7809	EVQ11G07K	SWITCH,SEARCH F	1	
S7810	EVQ11G07K	SWITCH,OPEN/CLOSE	1	
S7812	EVQ11G07K	SWITCH,TOP WINDOW	1	
S7814	EVQ11G07K	SWITCH,RETURN	1	
S7815	EVQ11G07K	SWITCH,LEFT	1	
S7816	EVQ11G07K	SWITCH,RIGHT	1	
S7817	EVQ11G07K	SWITCH,ENTER	1	
S7901	EVQ11L05R	SWITCH,SET	1	
S7902	EVQVXD00112B	SWITCH,TIME WARP	1	
T0701	EQV5EC082P	TRANSFORMER	1	(EG)
T0701	EQV5EC083P	TRANSFORMER	1	(EB)
T7801	G4DYZ0000003	TRANSFORMER	1	
TU7401	ENG47316G1	TUNER PACK	1	(EG) 🗥
TU7401	ENG47317G1	TUNER PACK	1	
107401	LNG4731731	TONERTAGR	'	(EB) 🗥
VR503	EVMEASA01B23	V.R.,3.37V ADJ	1	
VR0701	EVNCBAA00B14	V.RESISTOR	1	
W501	ERJ6GEY0R00V	1/10W 0	1	*1
W501	ERJ6GEY0R00V	1/10W 0	1	*2
W501	ERJ3GEY0R00	1/16W 0	1	*3
W501	ERJ3GEY0R00	1/16W 0	1	*4
W502	ERJ8GEY0R00	1/8W 0	1	*1
W502	ERJ3GEY0R00	1/16W 0	1	*2
W502	ERJ3GEY0R00	1/16W 0	1	*4
W503	ERJ8GEY0R00	1/8W 0	1	*1
W503	ERJ6GEY0R00V	1/10W 0	1	*2
W503	ERJ3GEY0R00	1/16W 0	1	*4
W504	ERJ6GEY0R00V	1/10W 0	1	*1
W504	ERJ6GEY0R00V	1/10W 0	1	*2
W504	ERJ3GEY0R00	1/16W 0	1	*4
W505	ERJ3GEY0R00	1/16W 0	1	
W506	ERJ8GEY0R00	1/8W 0	1	*1
W506	ERJ3GEY0R00	1/16W 0	1	*4
W507-13	ERJ6GEY0R00V	1/10W 0	7	
			_	
W514	ERJ8GEY0R00	1/8W 0	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
W516,17	ERJ8GEY0R00	1/8W 0	2	
X0701	VLF1416	CRYSTAL OSCILLATOR	1	J0B4045A0002 (EG)
X0701	VLF1417	CRYSTAL OSCILLATOR	1	J0B4155A0003 (EB)
X0704	VLF1493	CRYSTAL OSCILLATOR	1	(EG)
X0704	VLF1495	CRYSTAL OSCILLATOR	1	(EB)
X7302	VSX0953	CRYSTAL OSCILLATOR	1	H0D245500006
X7501	VSX1043-T	CRYSTAL OSCILLATOR	1	H0D100500006
X7503	H0D443400035	CRYSTAL OSCILLATOR	1	
X7504	VSX0666	CRYSTAL OSCILLATOR	1	
Z001	ERZVGAD471	V.R.	1	Δ
ZB7001	VMD3745	IR RECEIVER HOLDER	1	
ZB7801	RJF0033	FL HOLDER	1	
ZD501	MA4051N	DIODE	1	
ZD502	MA4027	DIODE	1	
ZD503	MA4075N	DIODE	1	
ZD504	MA4390N	DIODE	1	

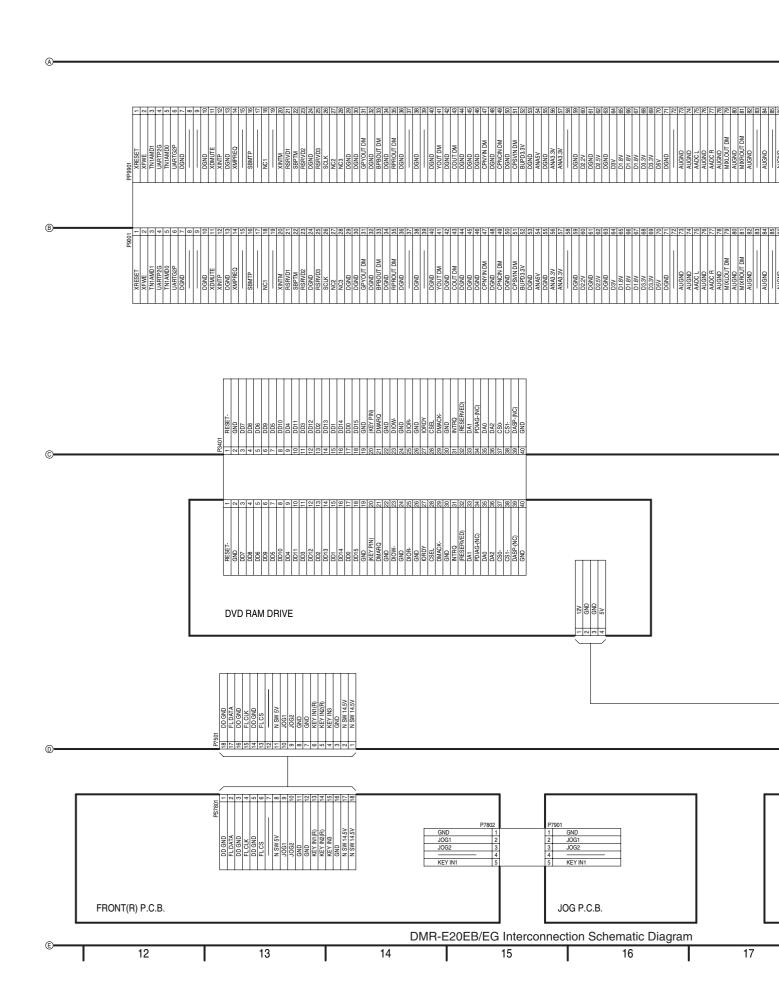
19. Schematic Diagram for printing with A4 size H010900000TK/TH

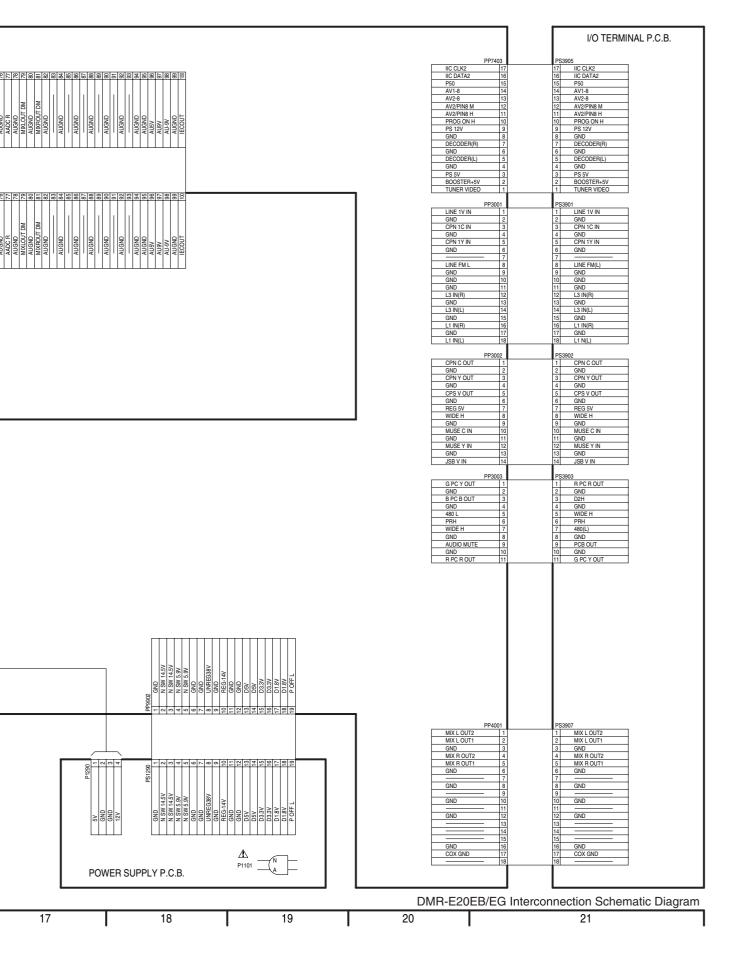
15 Schematic Diagram

15.1. Interconnection

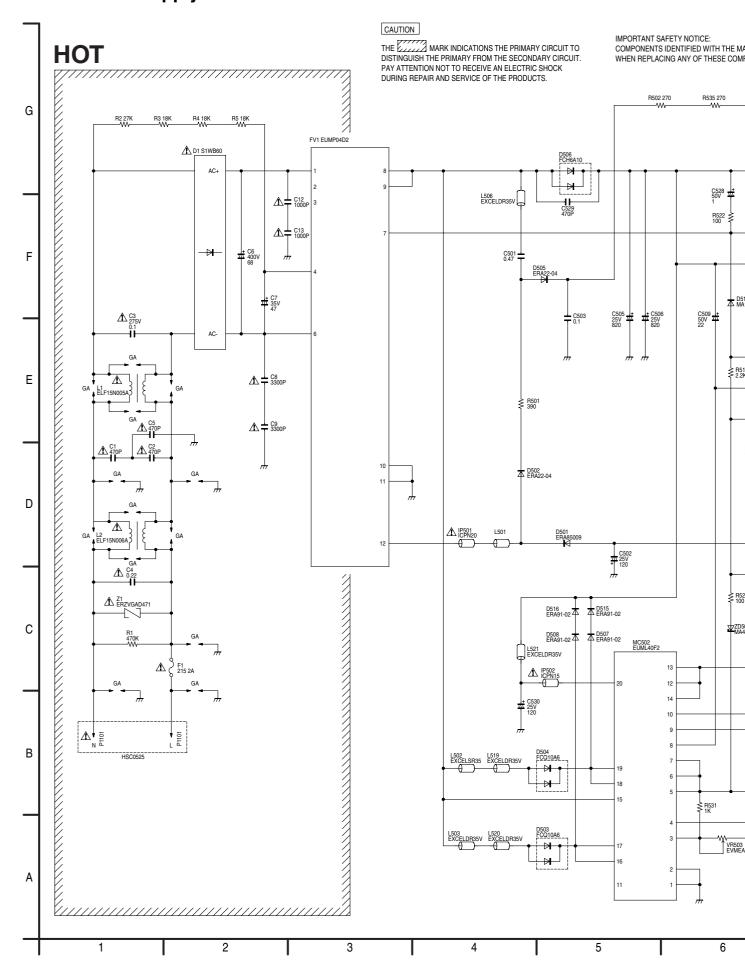


MAIN P.C.B. • SUB POWER AUDIO MAIN MAIN NET RF I/F VIDEO MAIN • TIMER DIGITAL P.C.B. DIGITAL NET AUDIO PB • GLUE DVC • 1394 l/F AV DEC • SYSCON AV ENC MSD P.C.B. SW 5V IIC CLK IIC DATA DECODER(R) GND(TUNER) DECODER(L) 1394 N SWADY CPN 27 N GND CN 27 N GND CN 27 N GND CN 27 N GND AU GND A FRONT(L) P.C.B. DMR-E20EB/EG Interconnection Schematic Diagram 6 7 8 9 10 11



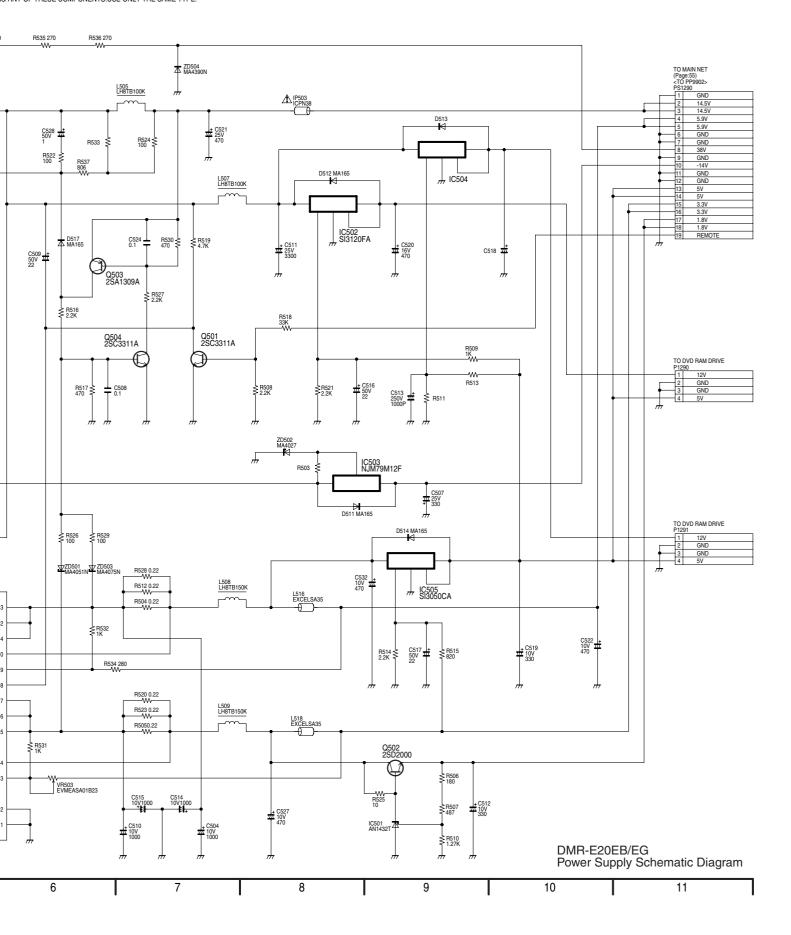


15.2. Power Supply

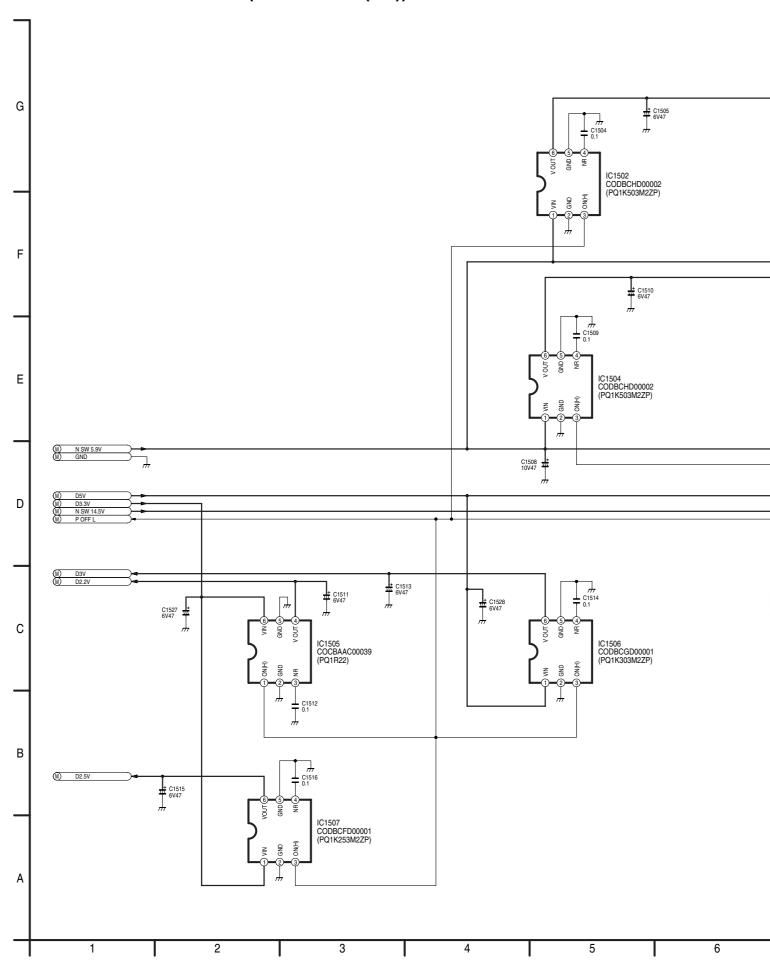


ETY NOTICE: JENTIFIED WITH THE MARK $\stackrel{\wedge}{\Lambda}$ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. IG ANY OF THESE COMPONENTS.USE ONLY THE SAME TYPE.

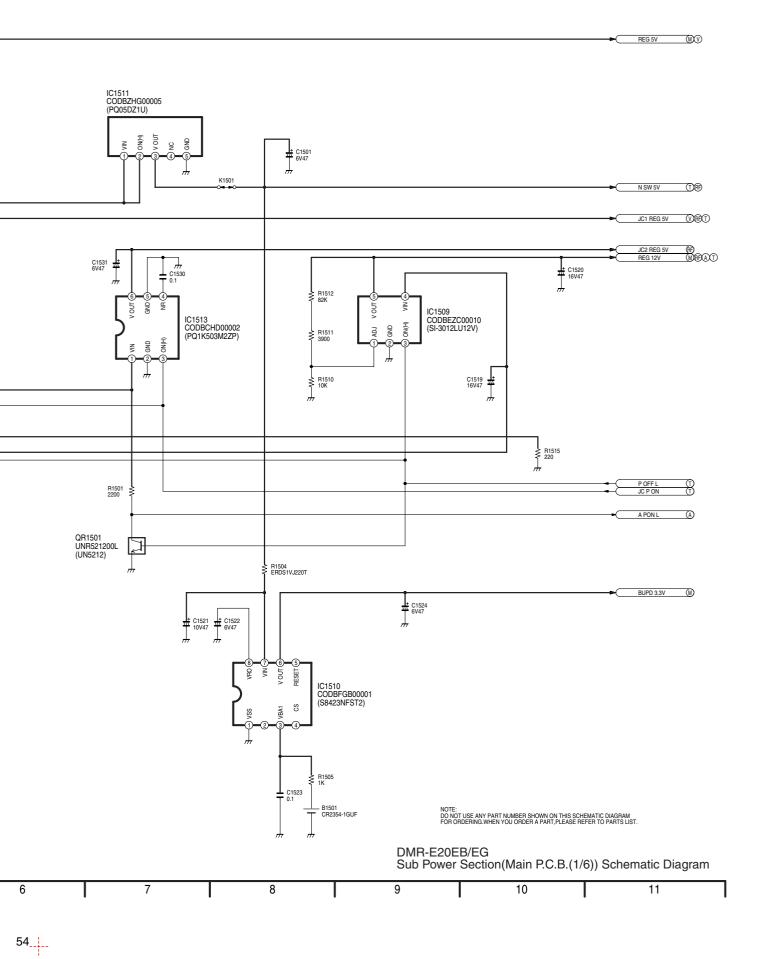
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST, AND MAY BE SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.



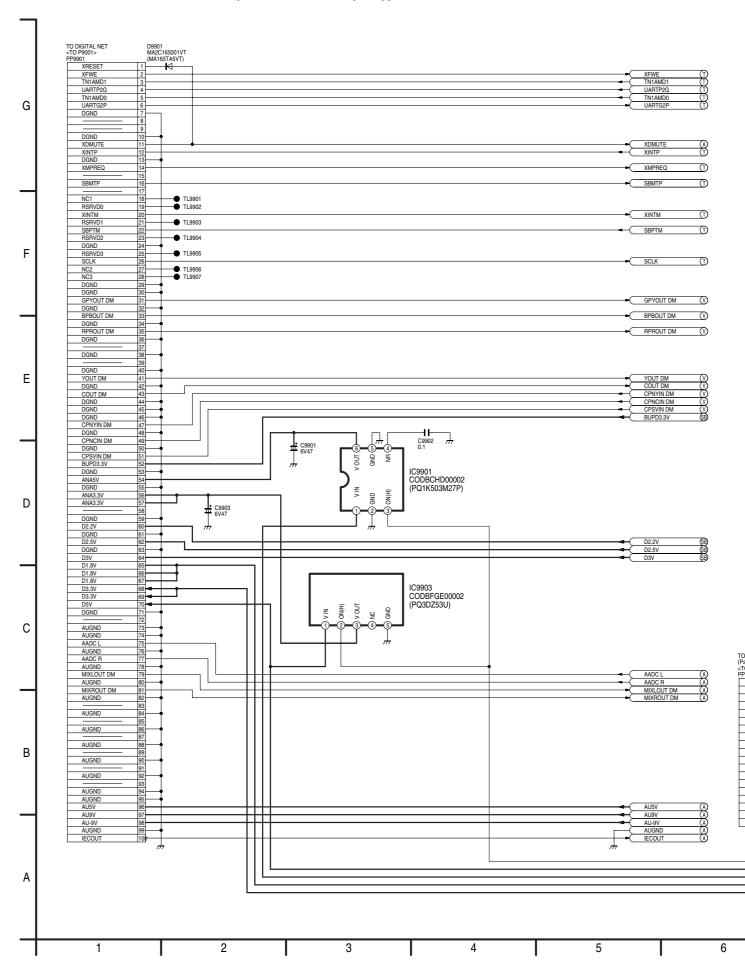
15.3. Sub Power Section (Main P.C.B. (1/6))



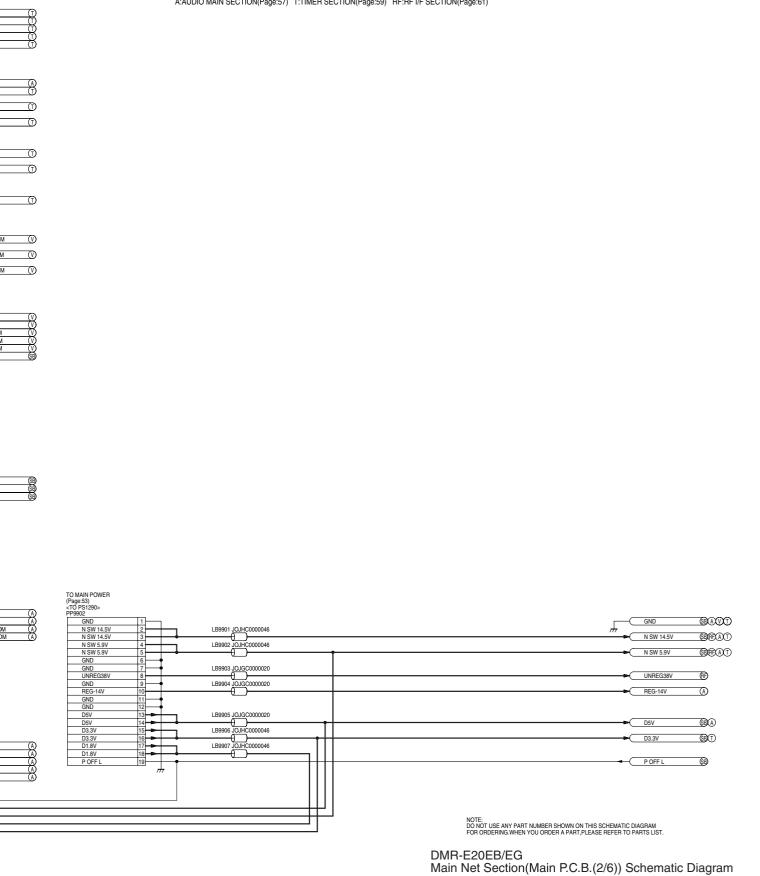
SB:SUB POWER SECTION(Page:54) M:MAIN NET SECTION(Page:55) V:VIDEO MAIN SECTION(Page:56) A:AUDIO MAIN SECTION(Page:57) T:TIMER SECTION(Page:59) RF:RF I/F SECTION(Page:61)



15.4. Main Net Section (Main P.C.B. (2/6))



SB:SUB POWER SECTION(Page:54) M:MAIN NET SECTION(Page:55) V:VIDEO MAIN SECTION(Page:56) A:AUDIO MAIN SECTION(Page:57) T:TIMER SECTION(Page:59) RF:RF I/F SECTION(Page:61)

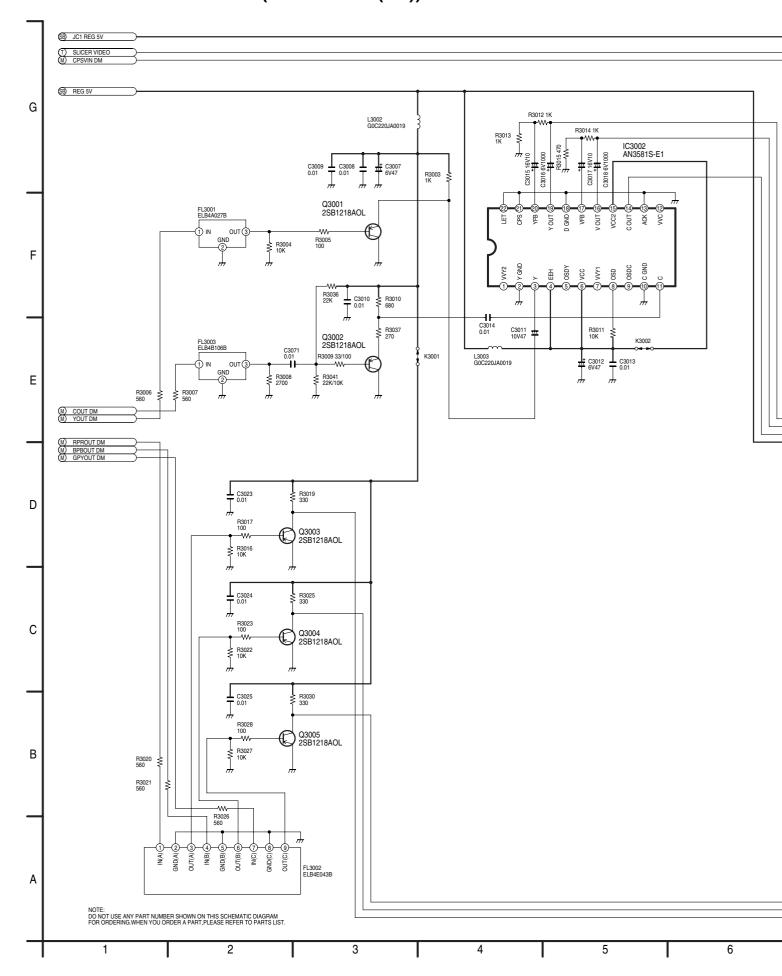


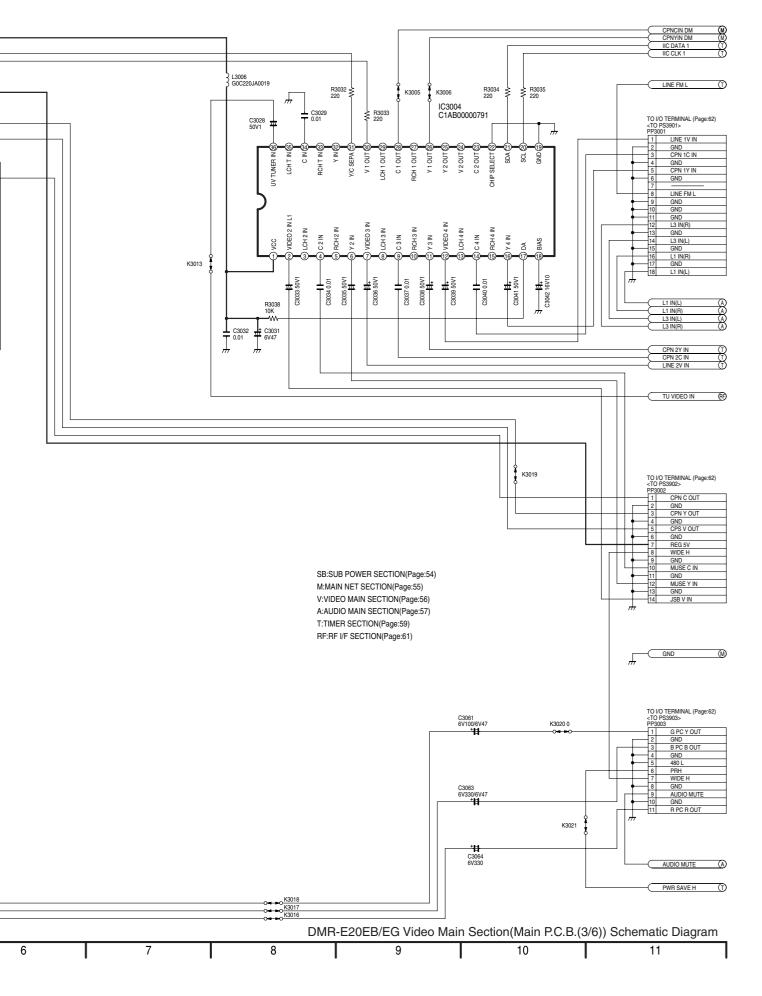
8

10

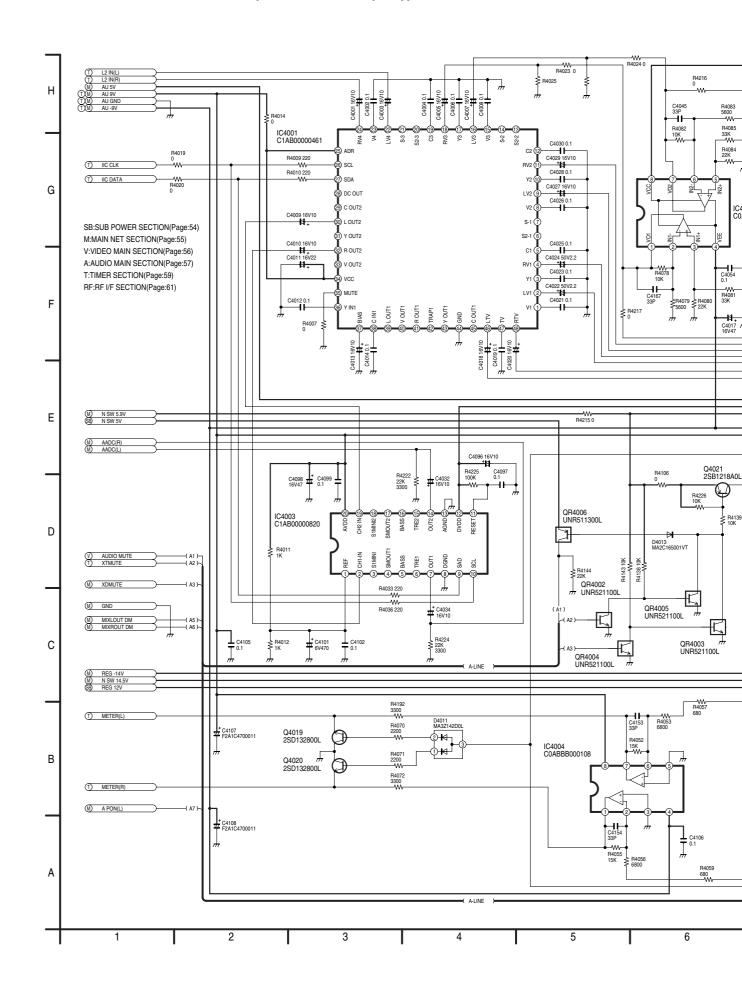
6

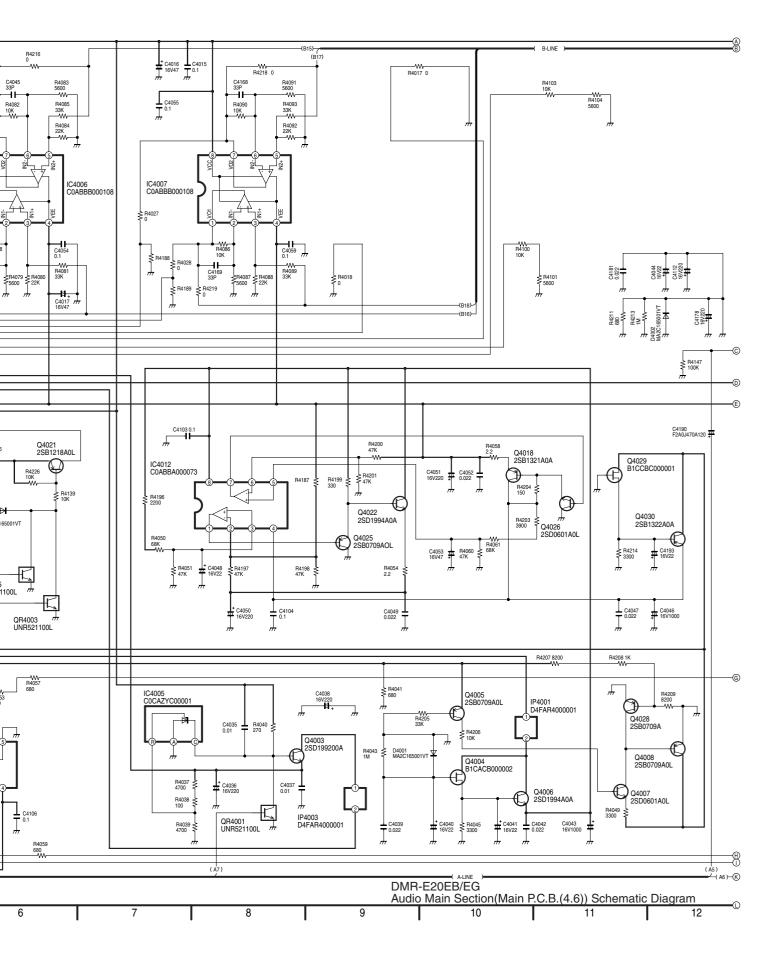
15.5. Video Main Section (Main P.C.B. (3/6))

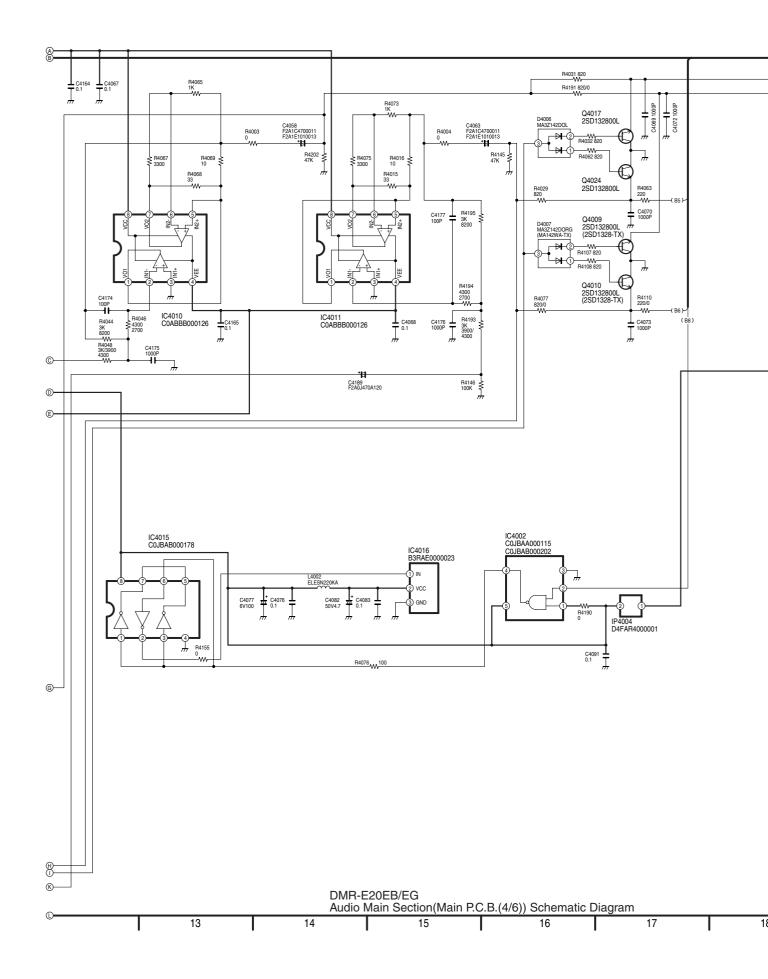




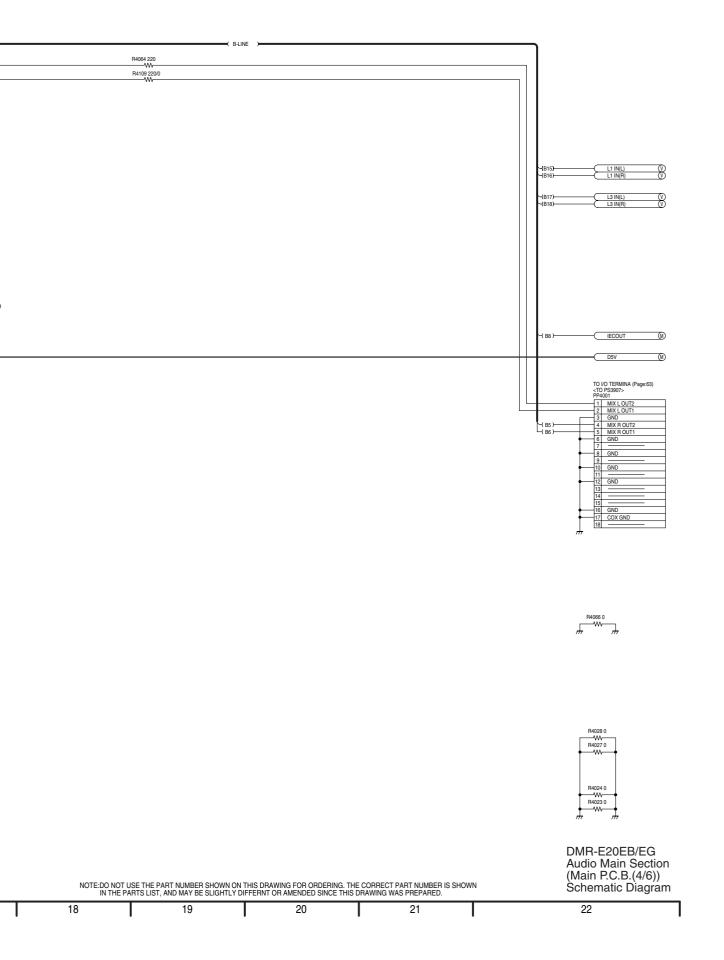
15.6. Audio Main Section (Main P.C.B. (4/6))



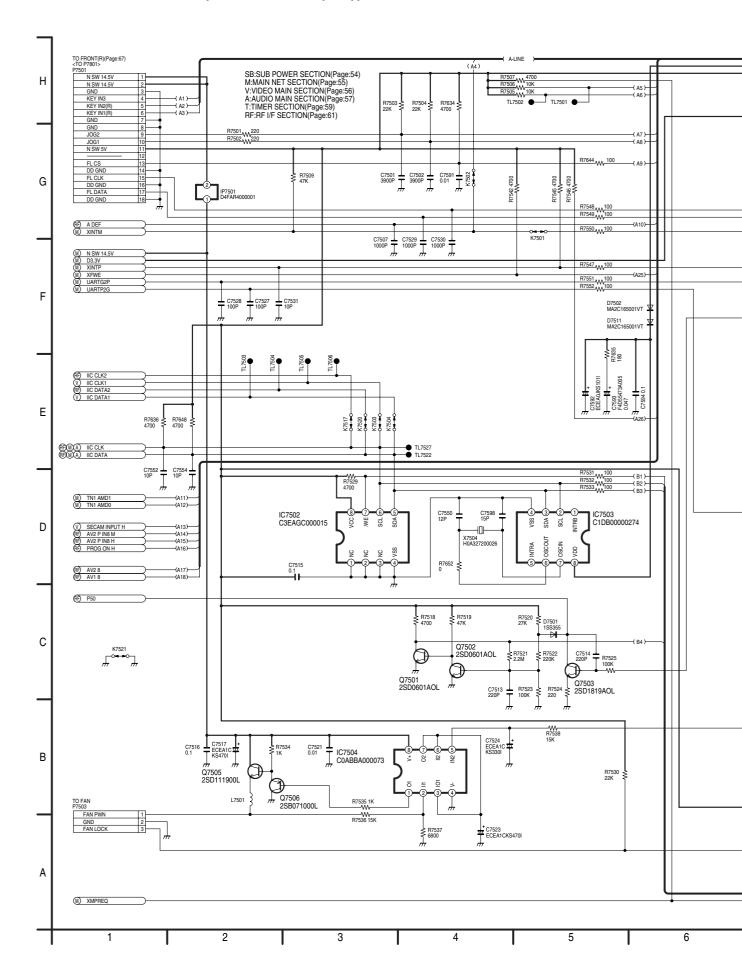


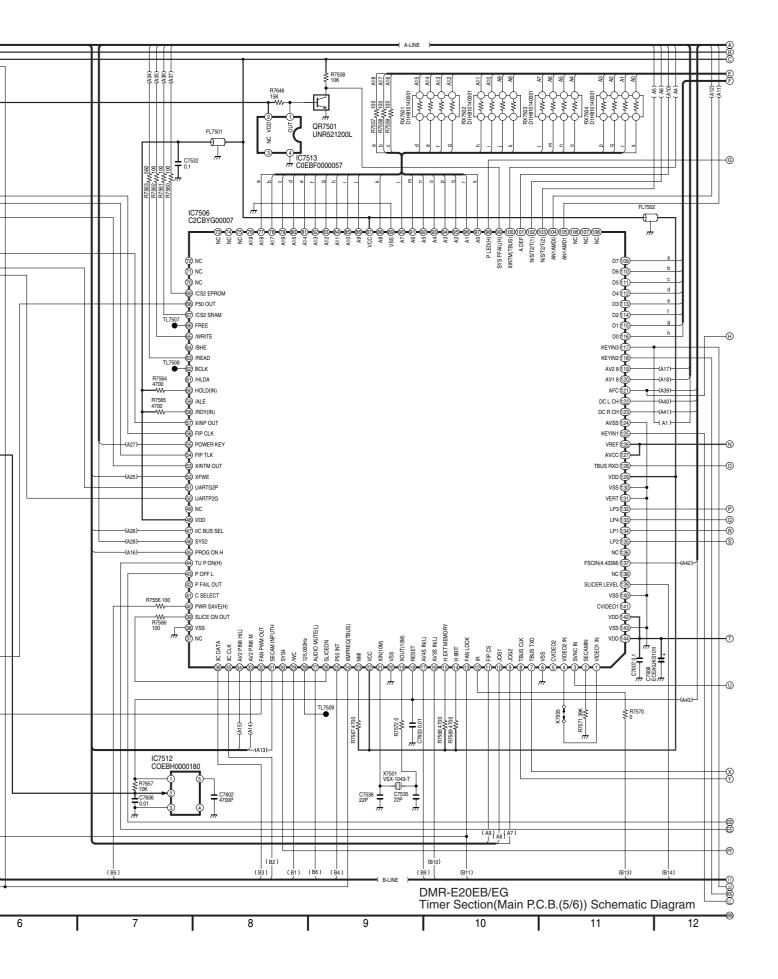


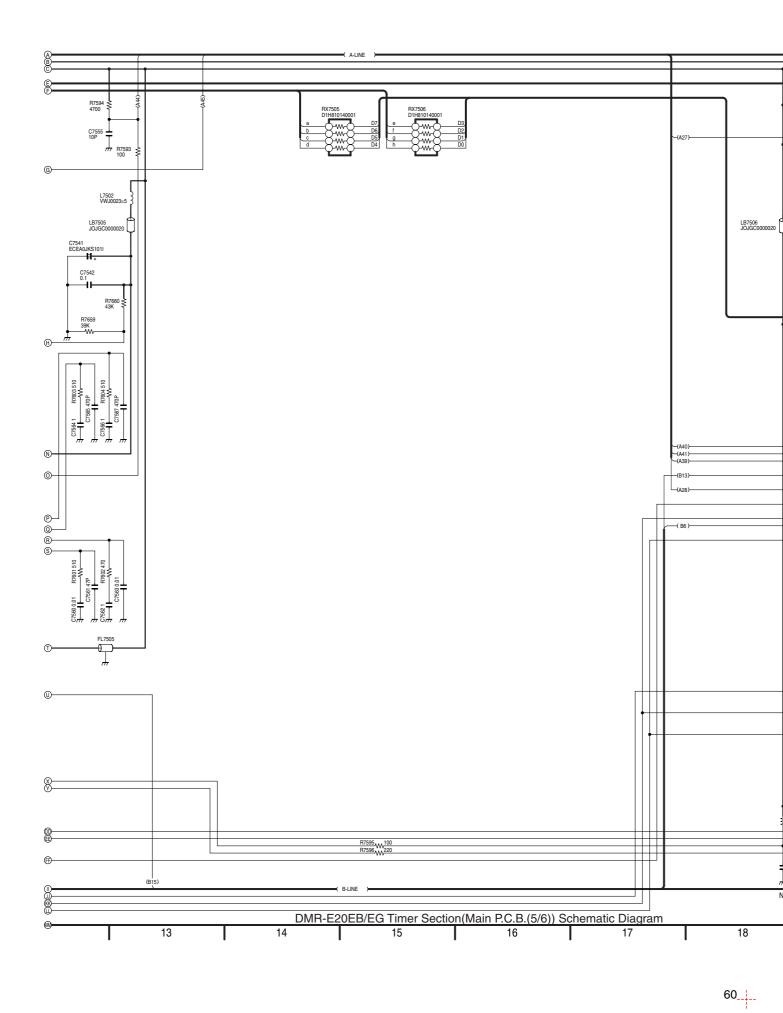


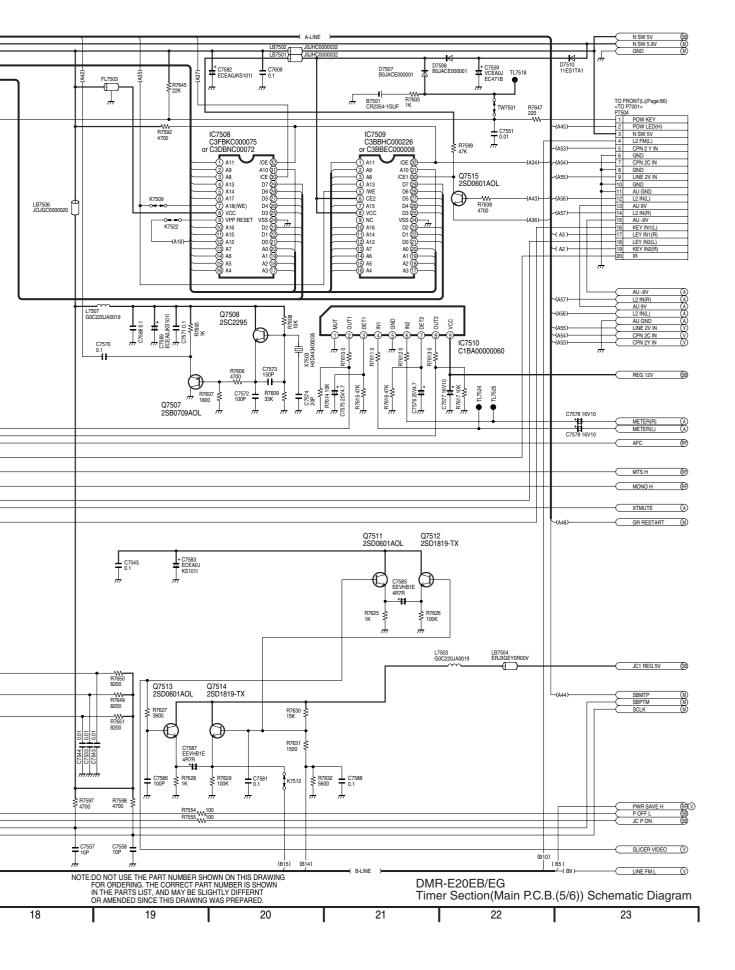


15.7. Timer Section (Main P.C.B. (5/6))

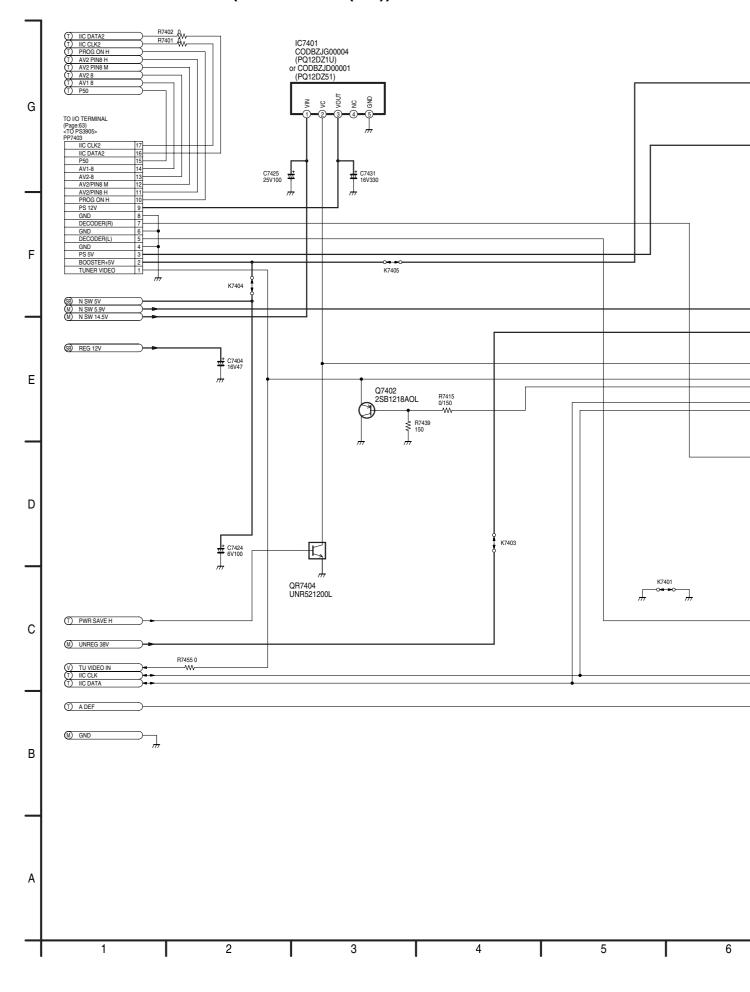




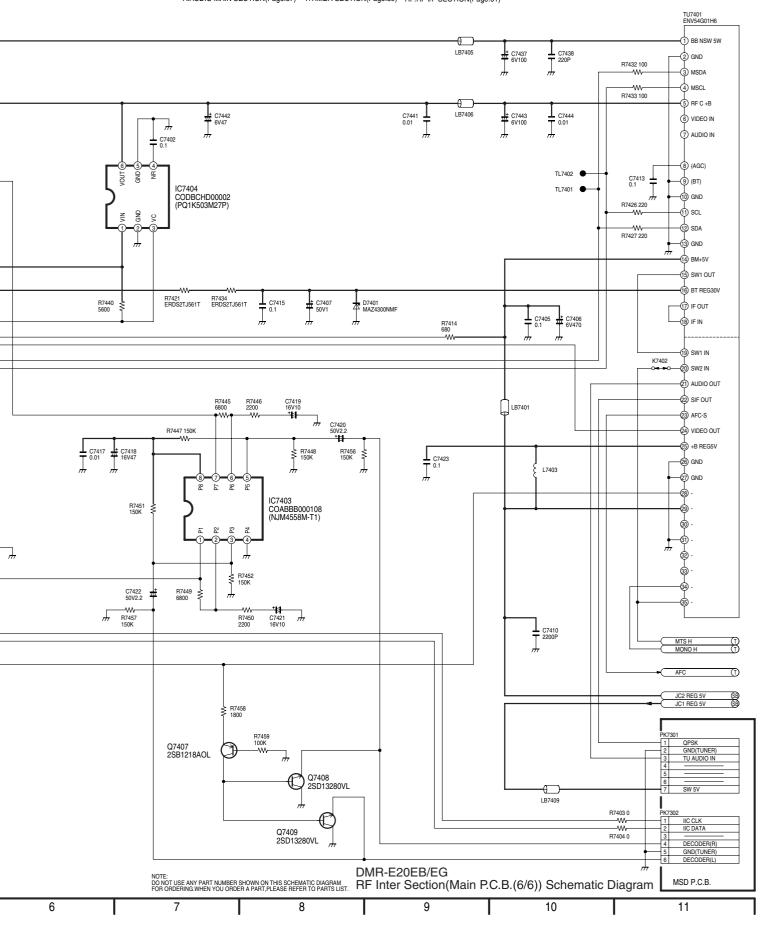




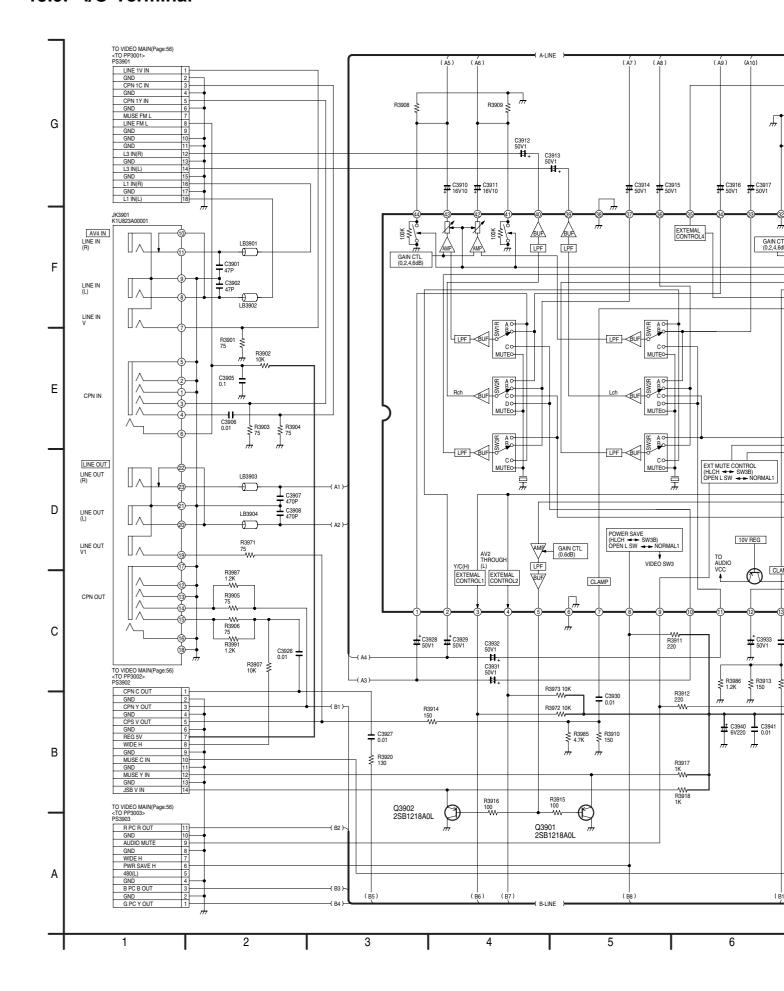
15.8. RF Inter Section (Main P.C.B. (6/6))

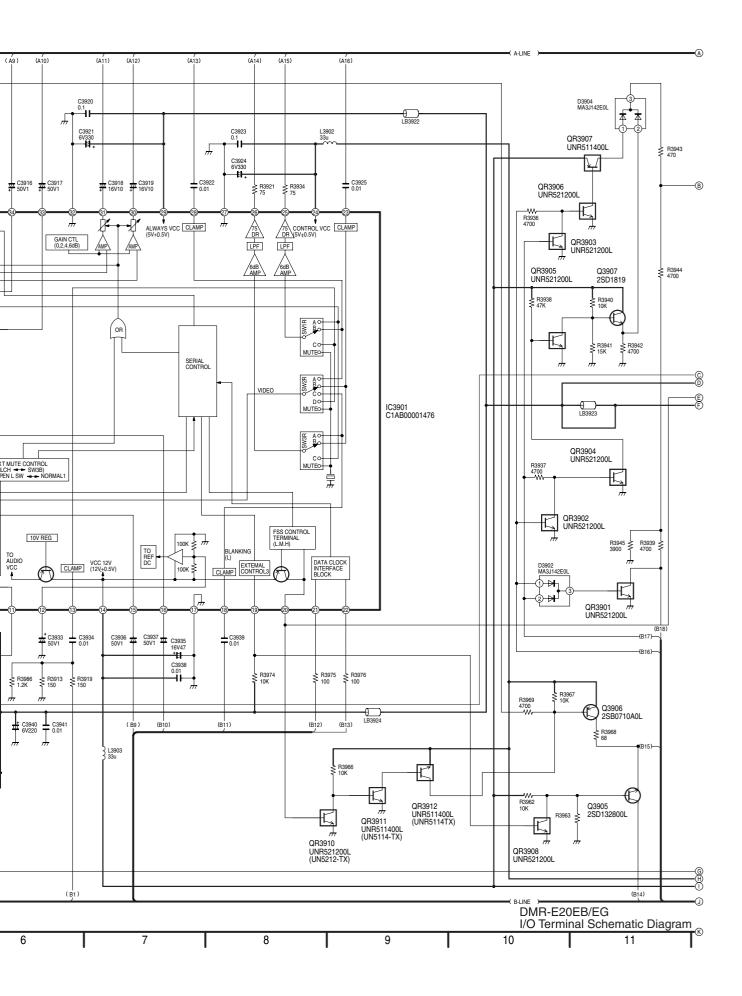


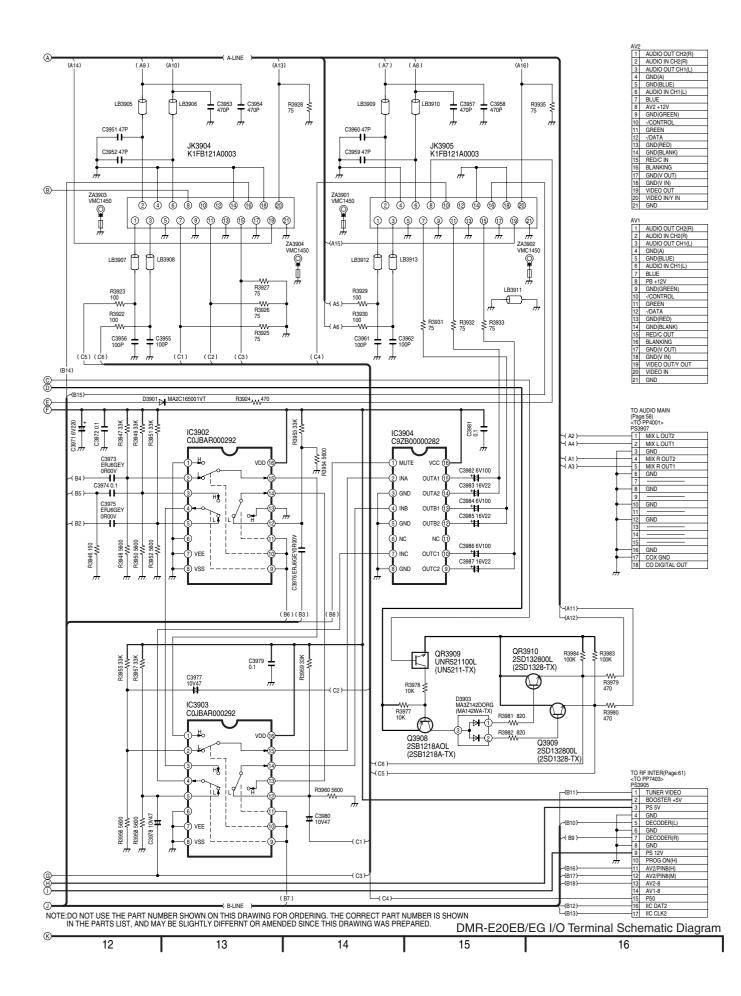
SB:SUB POWER SECTION(Page:54) M:MAIN NET SECTION(Page:55) V:VIDEO MAIN SECTION(Page:56)
A:AUDIO MAIN SECTION(Page:57) T:TIMER SECTION(Page:59) RF:RF I/F SECTION(Page:61)



15.9. I/O Terminal







DUT CH2(R)
N CH2(R)
DUT CH1(L)
UE)
N CH1(L)

DUT CH2(R)
N CH2(R)
N CH2(R)
DUT CH1(L)
UE)
N CH1(L)
IEEN)
ROOL
DUT
ANK)
DUT
NG
DUT
N
N
DUTTY OUT
N

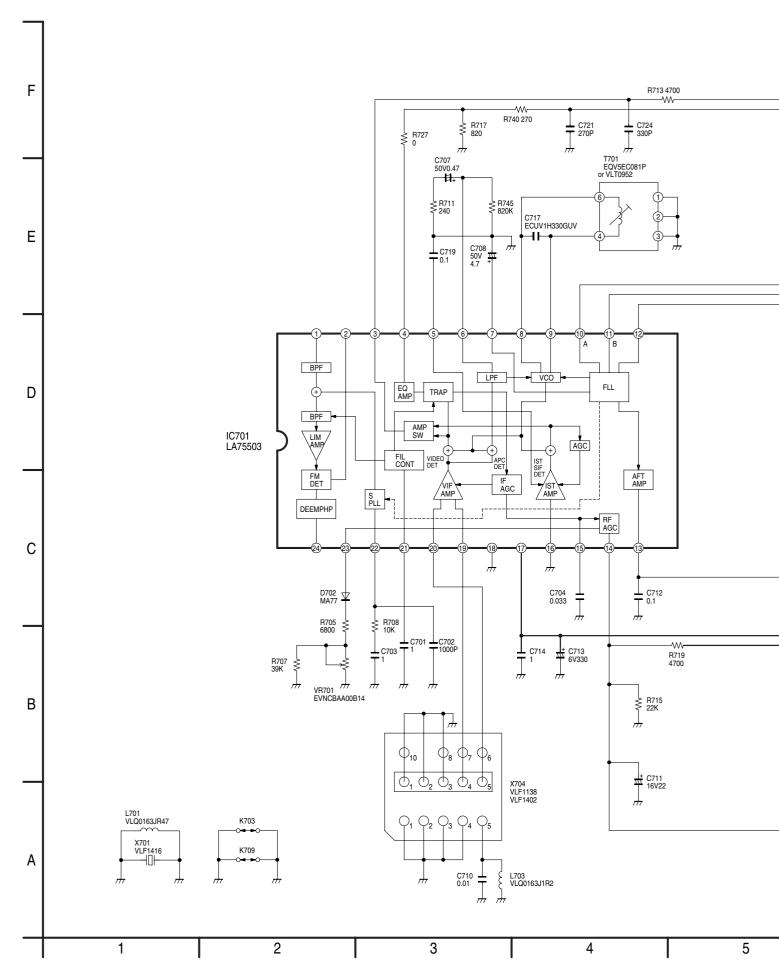
UT2	
UT1	
UT2 UT1	
UT1	
_	
D	
D TAL OUT	

Page:61)
VIDEO
ER +5V

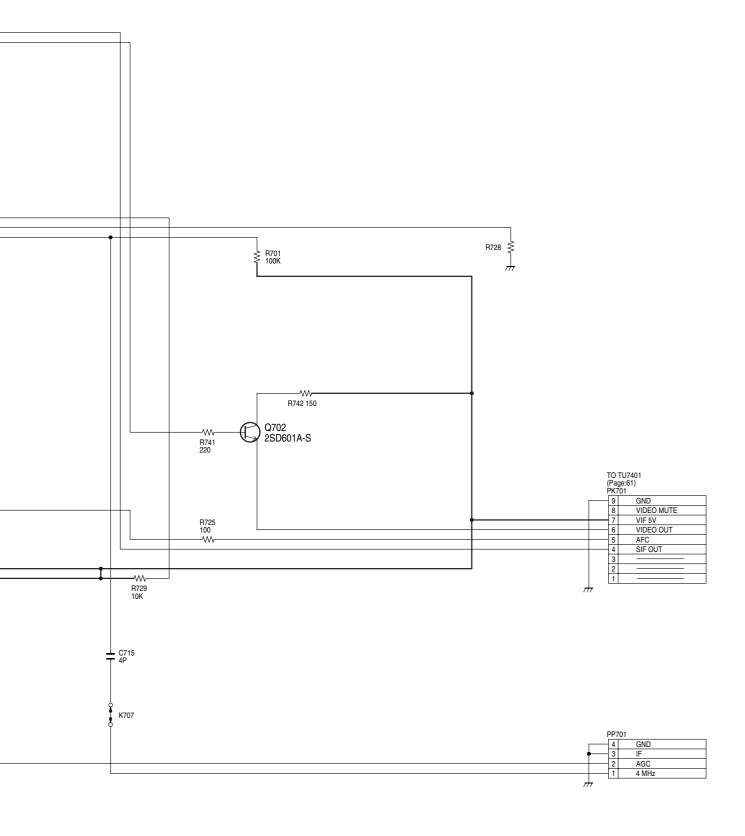
ER +5V	
ER(L)	
R(R)	
N(H)	
8(H)	
8(M)	
2	

c Diagram

15.10. VIFU







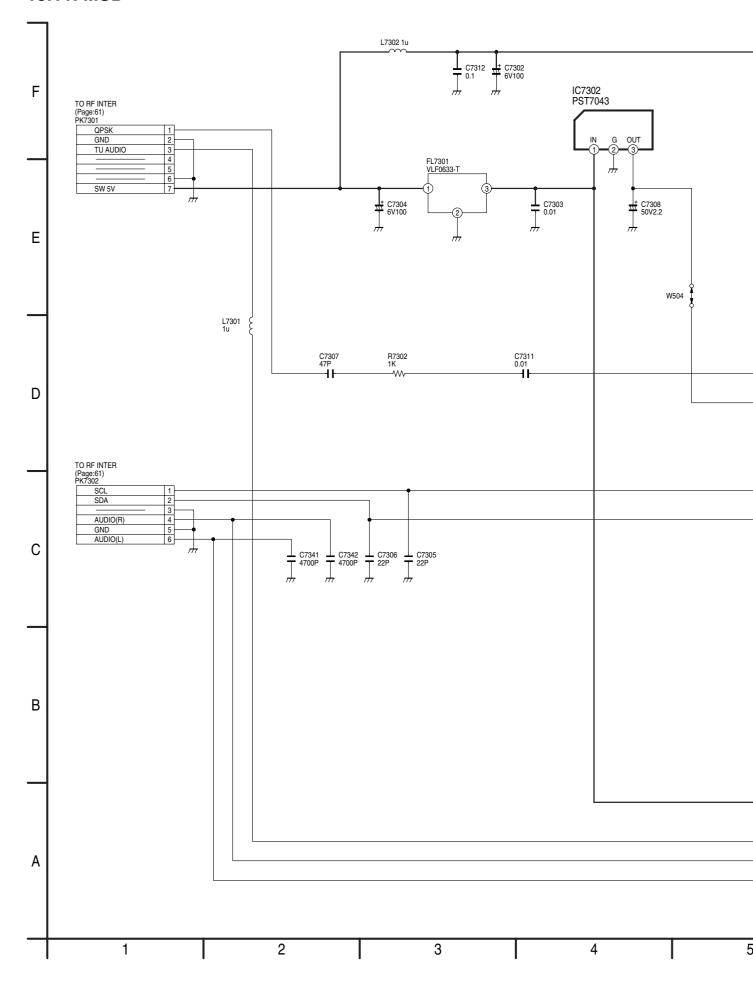
NOTE:
DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM
FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

DMR-E20EB/EG
VIFU Schematic Diagram

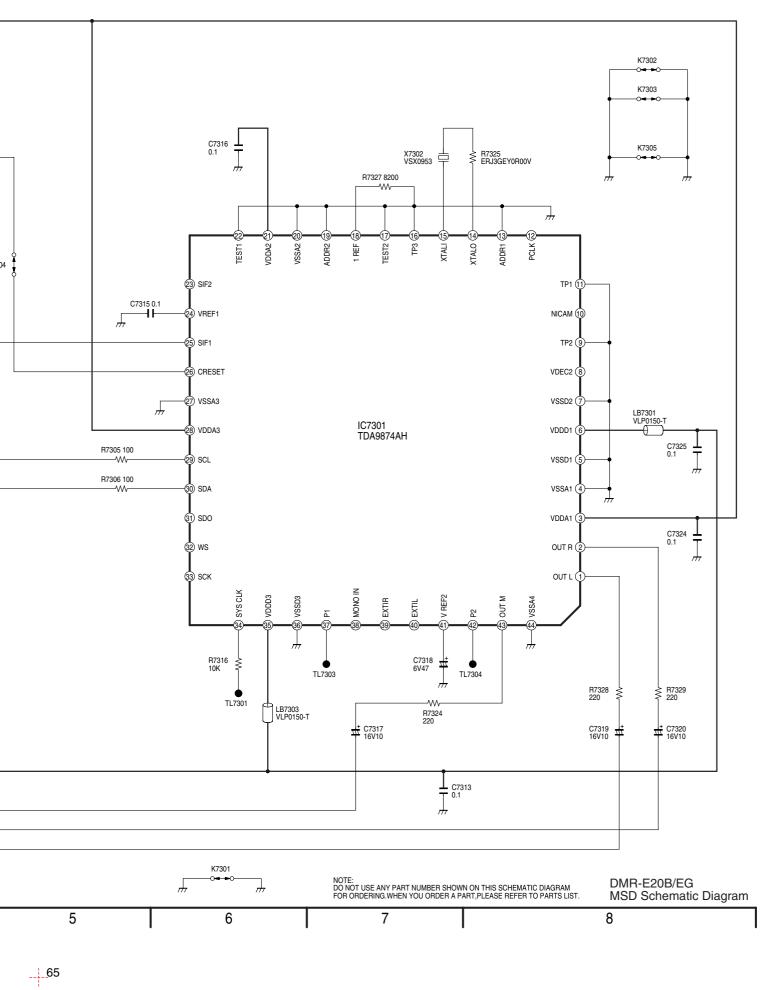
7

8

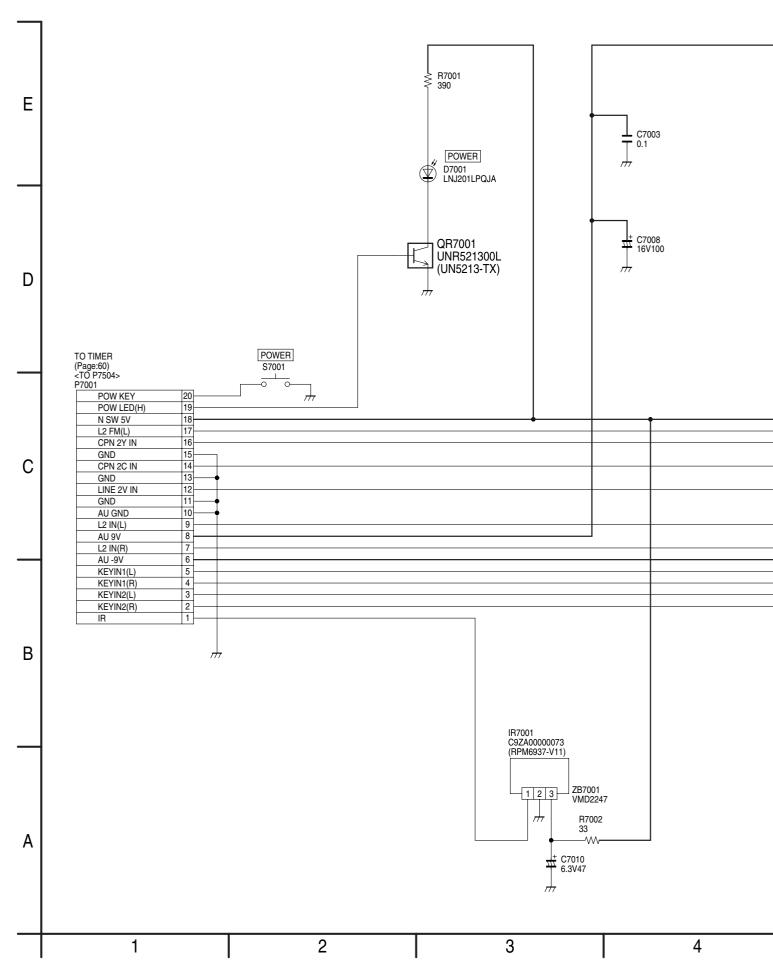
15.11. MSD

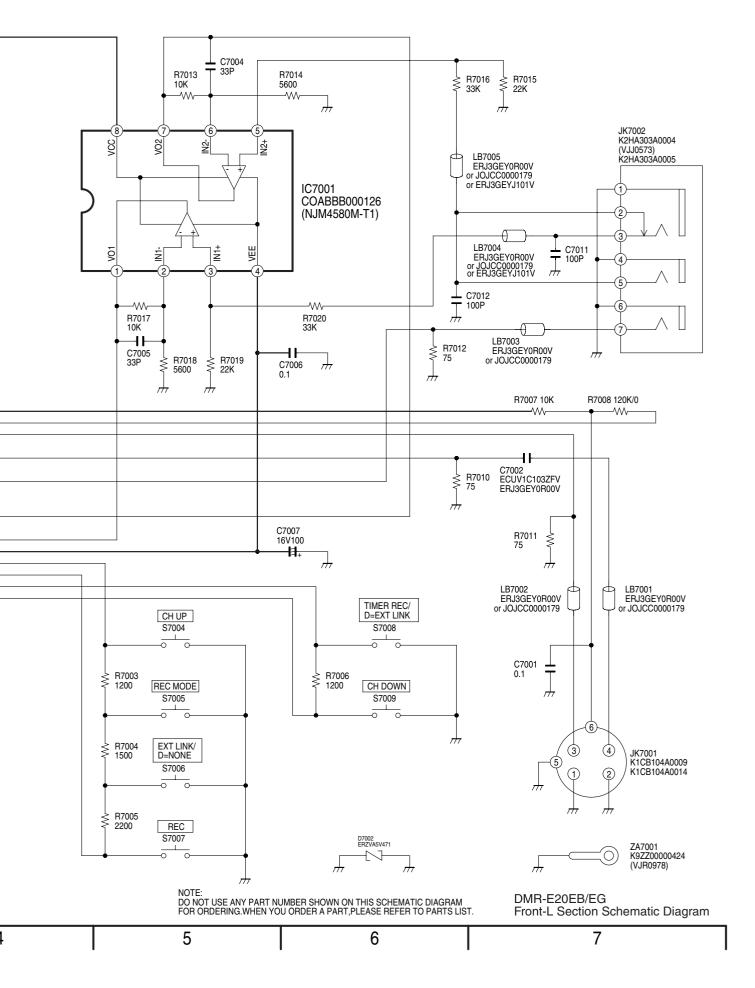




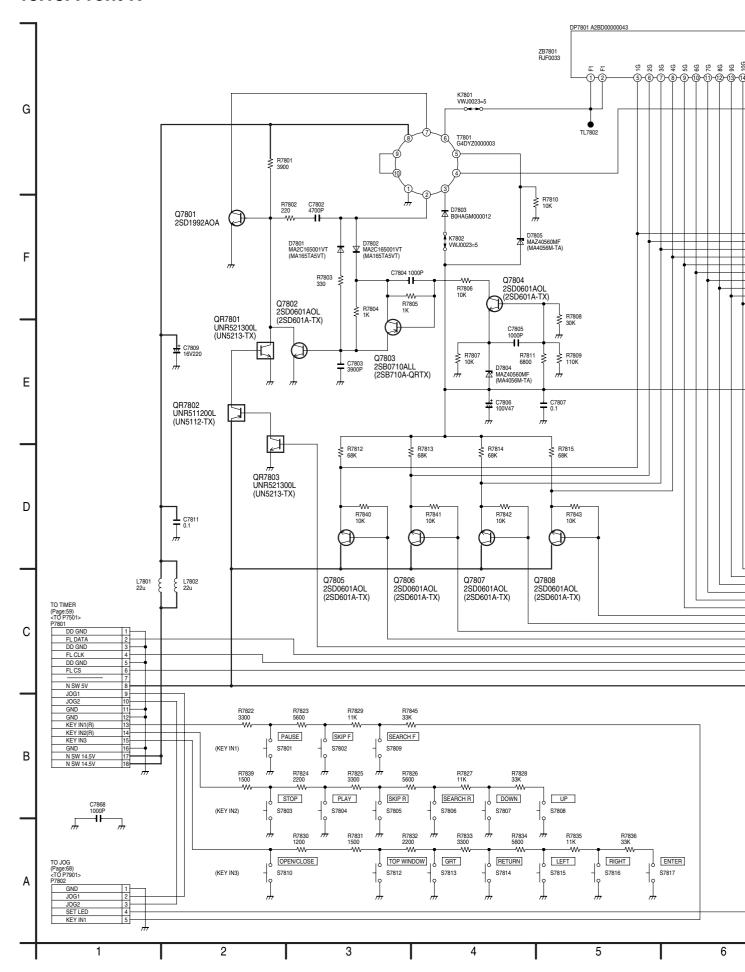


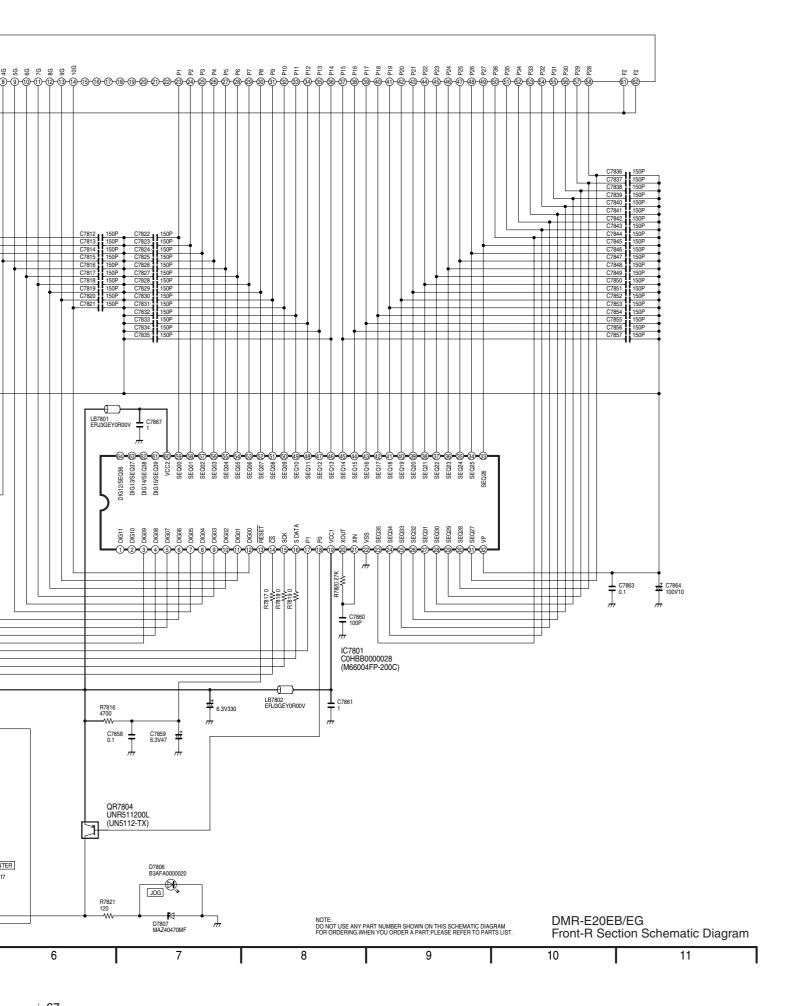
15.12. Front-L





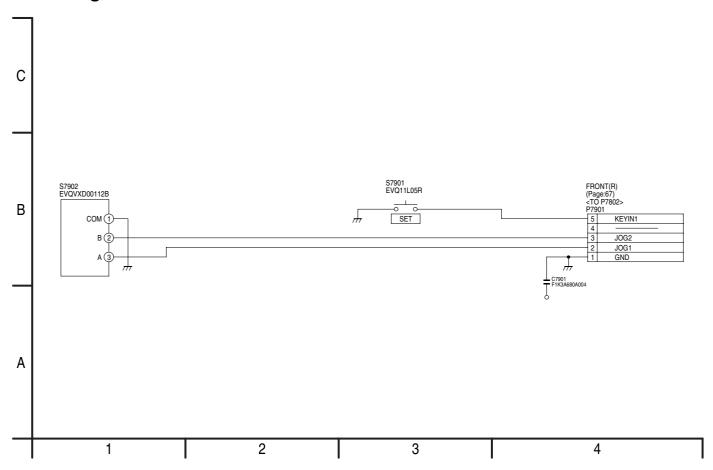
15.13. Front-R







15.14. Jog



Ref No.			IC502						IC503							IC505			
MODE	1	2	3	4	5			1	2	3				1	2	3	4	5	
REC	0	12.1	14.6	3.4	12.1			-14.4	-17.5	-2.5				0	4.9	6.0	1.7	4.9	
PLAY	0	12.1	14.6	3.4	12.1			-14.4	-17.5	-2.5				0	4.9	6.0	1.7	4.9	
STOP	0	12.1	14.6	3.4	12.1			-14.4	-17.5	-2.5				0	4.9	6.0	1.7	4.9	
Ref No.		Q501					Q502					Q503					Q504		
MODE	Е	С	В			Е	С	В			Е	С	В			Е	С	В	
REC	0	0	0.7			1.9	3.4	2.7			14.5	0	14.5			0	14.5	0	
PLAY	0	0	0.7			1.9	3.4	2.7			14.5	0	14.5			0	14.5	0	
STOP	0	0	0.7			1.9	3.4	2.7			14.5	0	14.5			0	14.5	0	

Ref No.										IC7	301									
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.5	2.5	5.0	0	0	5.0	0	0	0	1.3	0	1.4	0	1.5	1.5	0	0	2.0	0	0
PLAY	2.5	2.5	5.0	0	0	5.0	0	0	0	1.3	0	1.4	0	1.5	1.5	0	0	2.0	0	0
STOP	2.5	2.5	5.0	0	0	5.0	0	0	0	0	0	1.3	0	1.5	1.5	0	0	2.0	0	0
Ref No.										IC7	301									
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	3.2	0	1.9	1.9	1.9	5.0	0	5.0	4.5	4.2	1.3	1.3	1.4	0.4	5.0	0	5.0	2.5	2.5	2.5
PLAY	3.2	0	1.9	1.9	1.9	5.0	0	5.0	4.5	4.2	1.3	1.3	1.4	0.4	5.0	0	5.0	2.5	2.5	2.5
STOP	3.2	0	1.9	1.9	1.9	5.0	0	5.0	4.5	4.1	1.3	1.4	1.6	0.4	5.0	0	5.0	2.5	2.5	2.5
Ref No.		IC7	301															-	-	
MODE	41	42	43	44																
REC	2.5	5.0	2.5	0																
PLAY	2.5	5.0	2.5	0																
STOP	2.5	5.0	2.5	0																
Ref No.		IC7302																		
MODE	1	2	3																	
REC	5.0	0	5.0																	
PLAY	5.0	0	5.0		,															
STOP	5.0	0	5.0				,				,							·	·	·

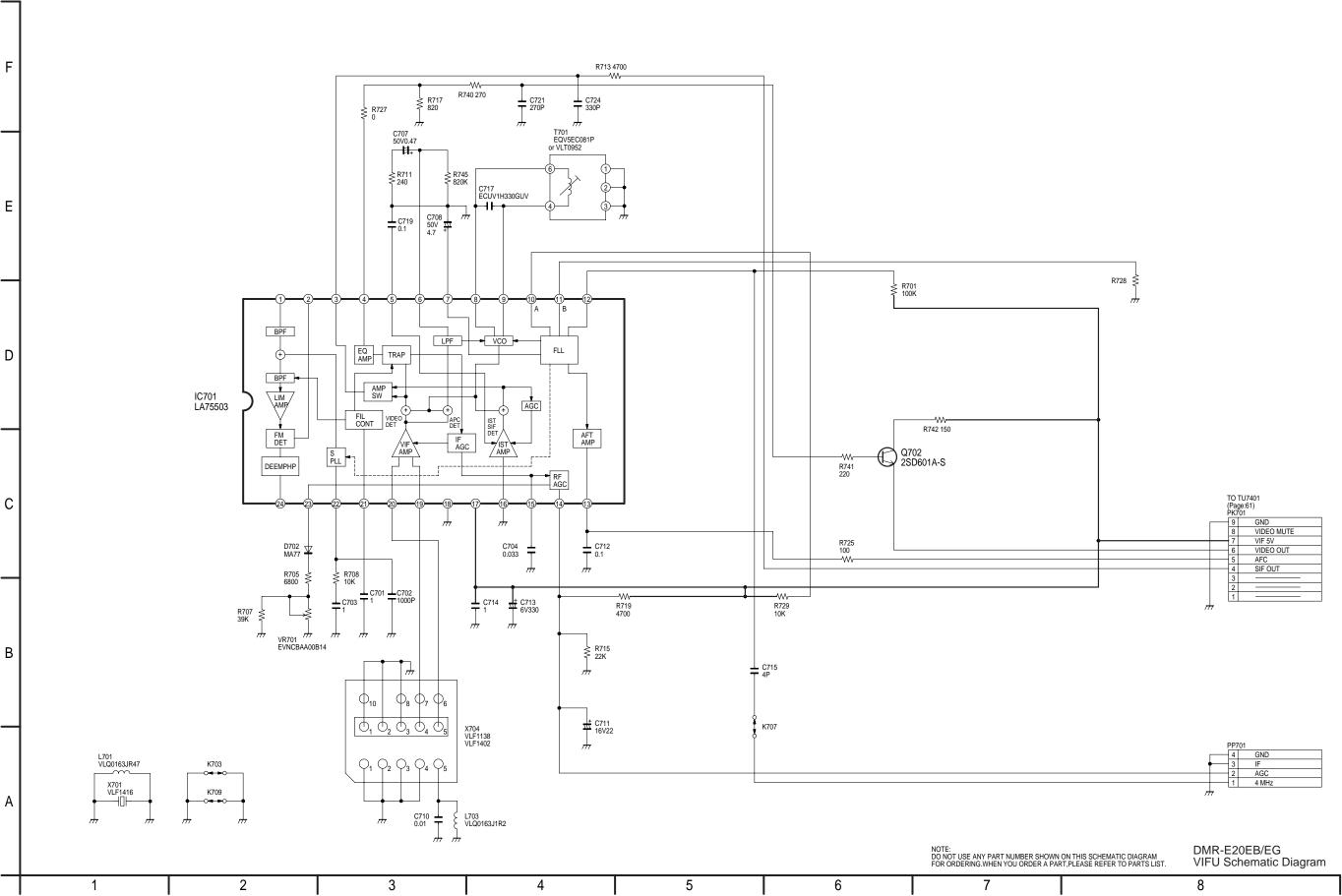
Ref No.		QR1501			QR4001			QR4002			QR4003	1		QR4004		
MODE	Е	С	В	Е	С	В	Е	С	В	Е	С	В	Е	С	В	
REC	0	0	4.7	0	5.7	0	0	0	4.9	0	5.8	0	0	0	2.3	
PLAY	0	0	4.7	0	5.7	0	0	0	4.9	0	5.8	0	0	0	2.3	
STOP	0	0	4.7	0	5.7	0	0	0	4.9	0	5.9	0	0	0	2.3	
Ref No.		QR4005			QR7501			QR7502			QR7503					
MODE	Е	С	В	Е	С	В	Е	С	В	Е	С	В				
REC	0	5.9	0	0	0	2.2	5.0	0	4.9	5.0	0	5.0				
PLAY	0	5.7	0	0	0	2.2	5.0	0	4.9	5.0	0	4.9				
STOP	0	5.9	0	0	0	2.2	5.0	0	4.9	5.0	0	4.9				

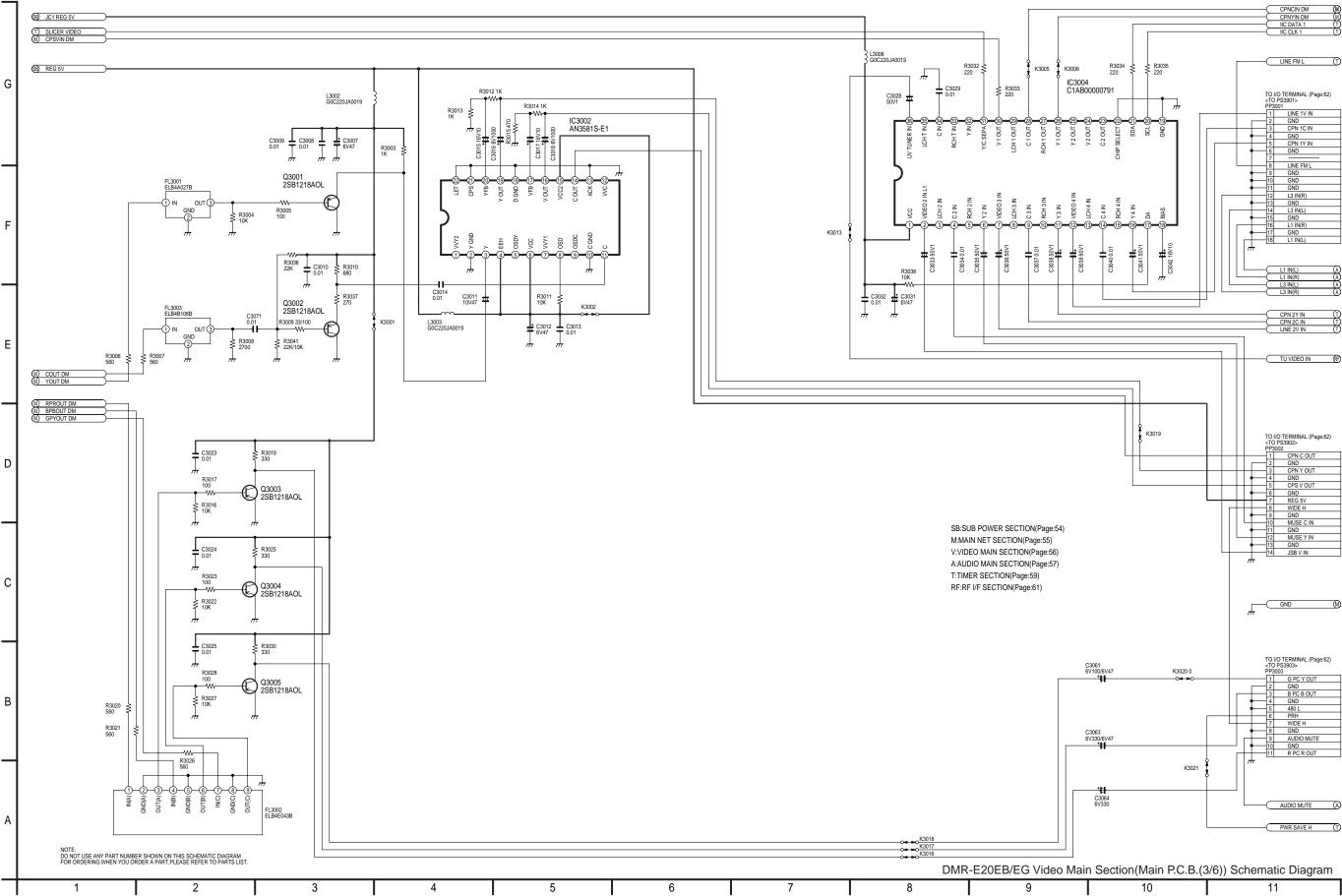
Ref No.				IC4	IC4011 4 5 6 7 8								IC4	012			IC4012						
MODE	1	2	3			6	7			1	2	3	4	5	6	7	8						
REC	8.4	0.2	0	0.7	8.4	8.4	8.4	9.2		9.4	4.6	4.6	-11.4	-4.5	-4.5	-9.2	11.5						
PLAY STOP	8.4 0	0.2	0	0.7 -9.0	8.4 0	8.4 0	8.4 0	9.2 9.2		9.4 9.4	4.6 4.6	4.6 4.6	-11.4 -11.4	-4.5 -4.5	-4.5 -4.5	-9.2 -9.2	11.5 11.5						
Ref No.	U	IC4016	- 0	-9.0	U	U	U		402	9.4	4.0	4.0	-11.4	-4.5	-4.5	-9.2	11.5						
MODE	1	2	3		1	2	3	4	5	6	7	8											
REC	2.4	4.9	0		0	5.0	1.5	0	3.5	5.0	0	5.0											
PLAY	2.4	4.9	0		0	5.0	1.5	0	3.5	5.0	0	5.0											
STOP Ref No.	2.4	4.9	0	IC7	0 504	5.0	1.5	0	3.5	5.0	0 IC7505	5.0								<u> </u>			
MODE MODE	1	2	3	4	5	6	7	8		1	2	3				T .	ı	1	1	1			
REC	7.0	2.2	2.2	0	2.2	2.2	2.2	14.7		4.9	0	4.9											
PLAY	7.0	2.2	2.2	0	2.2	2.2	2.2	14.7		4.9	0	4.9											
STOP	7.0	2.2	2.2	0	2.2	2.2	2.2	14.7		4.9	0	4.9											
Ref No.	4	0	0	4	-	0	-	0	_	_	507	40	40	44	45	40	47	40	40	- 00			
MODE REC	0	2 5.0	3 5.0	4.9	5 5.0	6 4.2	7	8	9	10 0	11 5.0	12 0	13 0	14 5.0	15 3.4	16 4.9	17 0	18 5.0	19 4.9	20 5.0			
PLAY	0	5.0	5.0	5.0	5.0	4.2	0	0	0	0	5.0	0	0	5.0	3.4	4.9	0	5.0	4.9	5.0			
STOP	0	5.0	5.0	4.9	5.0	4.2	1.0	1.2	0	0	4.1	0	0	5.0	3.4	5.0	0	5.0	4.9	5.0			
Ref No.	-									IC7	507					-	-	-	-				
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
REC	0.1	0	5.0	0	4.9	0	0	0	0	0	0	0	5.4	5.1	1.5	1.3	5.2	2.3	2.1	0			
PLAY STOP	0	0	4.9 5.0	0	4.9 4.9	0	0	0	0	0	0	0	5.4 0	5.1 5.6	1.5	1.3	5.2 5.2	2.3	2.1	0			
Ref No.	Ü	Ŭ	5.0	Ü	7.0	Ŭ	Ü	J			507	Ŭ	<u> </u>	5.5	1.0	1.0	0.2	2.0		<u> </u>			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60			
REC	5.2	5.2	0	0	0	0	0	0	0	0	5.0	5.0	5.0	1.9	1.9	2.1	0	0.5	0	0			
PLAY	5.2	5.2	0	0	0	0	0	0	0	0	5.0	5.0	5.0	1.9	1.9	2.1	0	0.5	0	0			
STOP Ref No.	5.2	5.2	0	0	0	0	0	0	0	0 IC7	5.0 507	5.0	5.0	0	2.1	1.0	0	0	0	0			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80			
REC	5.0	5.0	0.1	0.1	5.0	5.0	5.0	4.2	3.4	4.3	4.3	4.2	0	0	0	0	2.2	5.0	5.0	5.0			
PLAY	5.0	5.0	0.1	0.1	5.0	5.0	5.0	4.2	3.4	4.3	4.3	4.2	0	0	0	0	2.2	5.0	5.0	5.0			
STOP	5.0	5.0	0.1	0.1	5.0	1.8	5.0	4.3	3.5	4.5	4.3	4.2	0	0	5.1	5.0	0	0.5	5.0	5.0			
Ref No. MODE	Q4	ຄວ	QΩ	Ω.4	QE	0c	87	QΟ	90	_	507	02	02	94	05	06	07	00	00	100			
REC	81 4.9	82 4.8	83 5.0	84 0	85 4.9	86 0	4.8	88 0	89 2.0	90 2.5	91 2.5	92 2.5	93	0.8	95 0.8	96 2.5	97 2.5	98 5.0	99 5.0	100			
PLAY	4.9	4.8	5.0	0	4.9	0	4.8	0	2.0	2.5	2.5	2.5	0	0.8	0.8	2.5	2.5	5.0	5.0	0			
STOP	0	0	0	0	5.0	0	4.8	0	2.0	2.5	2.5	2.5	0	0.8	0.8	2.5	2.5	5.0	5.0	0			
Ref No.					IC7510																		
MODE	1	2	3	4	5	6	7	8	9														
REC PLAY	0	0.4	0.5 0.5	2.4	0	2.5	0.5 0.5	0	12.0 12.0	—						 	 	-	-				
STOP	0	1.0	1.7	2.2	0	2.2	1.8	1.0	12.0							 	 	1	1				
Ref No.									511							-							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
REC	0.2	0.5	5.0	5.0	5.0	0	0	0	0	0	5.0	5.0	5.0	5.0	0.5	5.0							
PLAY	0.2	0.5	5.0	5.0	5.0	0	0	0	0	0	5.0	5.0	5.0	5.0	0.5	5.0	<u> </u>	-	-				
STOP Ref No.	0.2	0.5 IC7	5.0 513	5.0	5.0	0	0	0 IC9	0 901	0	5.0	5.0	5.0	5.0	0.5 IC9	5.0 902	<u> </u>	ь—		<u> </u>			
MODE NO.	1	2	3	4		1	2	3	4	5	6		1	2	3	4	5	6					
REC	2.2	3.3	0	0		6.0	0	4.9	1.2	0	5.0		4.9	0	4.9	1.2	0	3.3					
PLAY	2.2	3.3	0	0		6.0	0	4.9	1.2	0	5.0		4.9	0	4.9	1.2	0	3.3					
STOP	2.2	3.3	0	0		6.0	0	4.9	1.2	0	5.0		4.9	0	4.9	1.2	0	3.3	<u> </u>				
Ref No.		Q3001				Q3002				Q3007			1	Q3010		1	1	Q4002					
MODE NO.	Е	C	В		Е	C	В		Е	C	В		Е	C	В		Е	C C	В				
REC	1.9	0	1.3		1.9	0	1.2		1.6	0	1.0		1.7	0	1.0		0	0	0				
PLAY	1.7	0	1.1		1.9	0	1.2		1.6	0	1.0		1.7	0	1.0		0	0	0				
STOP	1.8	0	1.1		1.9	0	1.2		1.6	0	1.0		1.7	0	1.0		0	0	0				
Ref No. MODE	Е	Q4003 C	В		Е	Q4004 C	В		Е	Q4005 C	В		Е	Q4006 C	В	-	Е	Q4007 C	В				
REC	5.0	6.0	5.7		14.6	11.7	12.0		12.0	11.9	11.3		11.5	14.6	12.1		1.3	1.3	2.0				
PLAY	5.0	6.0	5.7		14.6	11.7	12.0		12.0	11.9	11.3		11.4	14.6	12.1		1.3	1.9	1.3				
STOP	5.0	6.0	5.7		14.6	11.7	11.9		12.0	11.9	11.3		11.4	14.6	12.1		-12.6	-12.6	-11.9				
Ref No.	_	Q4008			-	Q4009	_		-	Q4010	_		_	Q4017	_		<u> </u>	Q4018	-				
MODE REC	1.9	1.0	1.3		1.6	0 0	-0.9		1.4	0 0	-0.8		E 1.5	0 0	-1.2		E 0.7	0.9	0.8				
PLAY	1.9	0.9	1.3		1.5	0	-0.9		1.4	0	-1.1		1.5	0	-1.6	-	0.7	0.9	0.8				
STOP	-12.0	-14.5	-12.6		0	0	-1.1		0	0	-1.1		0	0	-1.2		-9.0	-11.4	-9.8				
Ref No.		Q4019				Q4020				Q4021				Q4022				Q4024					
MODE	E	C	В		E	C	В		E	C	В		E 0.4	C	B	ļ	E 4.4	С	B				
REC PLAY	0	0	0		0	0	0		6.0	5.9 -1.0	0 5.7		9.4 9.3	11.5 11.5	10.0		1.4 1.4	0	-0.1 -1.7				
STOP	0	0	0		0	0	0		6.0	-1.0 -1.1	5.7		9.3	11.5	10.0		0	0	-1.7				
Ref No.	v	Q4025	Ť		·	Q4026	Ť		5.5	Q4028	5.5		J. T	Q4029	, , , , ,		Ť	Q4030					
MODE	Е	С	В		Е	С	В		Е	С	В		Е	С	В		Е	С	В				
REC	10.0	0	9.4		8.0	0	0.8		0	1.2	6.6		1.0	1.8	0.4		0.9	0.9	0.3				
PLAY	10.0	0	9.4		0.8	0	0.8		0	1.3	6.6		1.0	1.7	0.4		0.9	1.0	0.4				
STOP Pof No	10.0	0 Q7402	9.4		-9.8	0 Q7504	-9.2		-0.7	-12.6 Q7505	-0.7		-14.5	-11.9 Q7506	-12.0		-11.4	-14.5 Q7516	-12.1	-			
Ref No. MODE	Е	Q7402	В		Е	Q7504 C	В		Е	Q7505	В		Е	Q7506	В		Е	Q/516	В				
REC	2.6	0	2.0		0	5.0	0		7.7	14.7	7.1		7.7	0	7.1		1.9	5.0	2.7				
PLAY	2.6	0	2.0		0	5.0	0		7.7	14.7	7.1		7.7	0	7.1		1.9	5.0	2.9				
STOP	2.6	0	2.0		0	0	5.0		7.7	14.6	7.2		7.7	0	7.1		1.7	5.0	2.6				

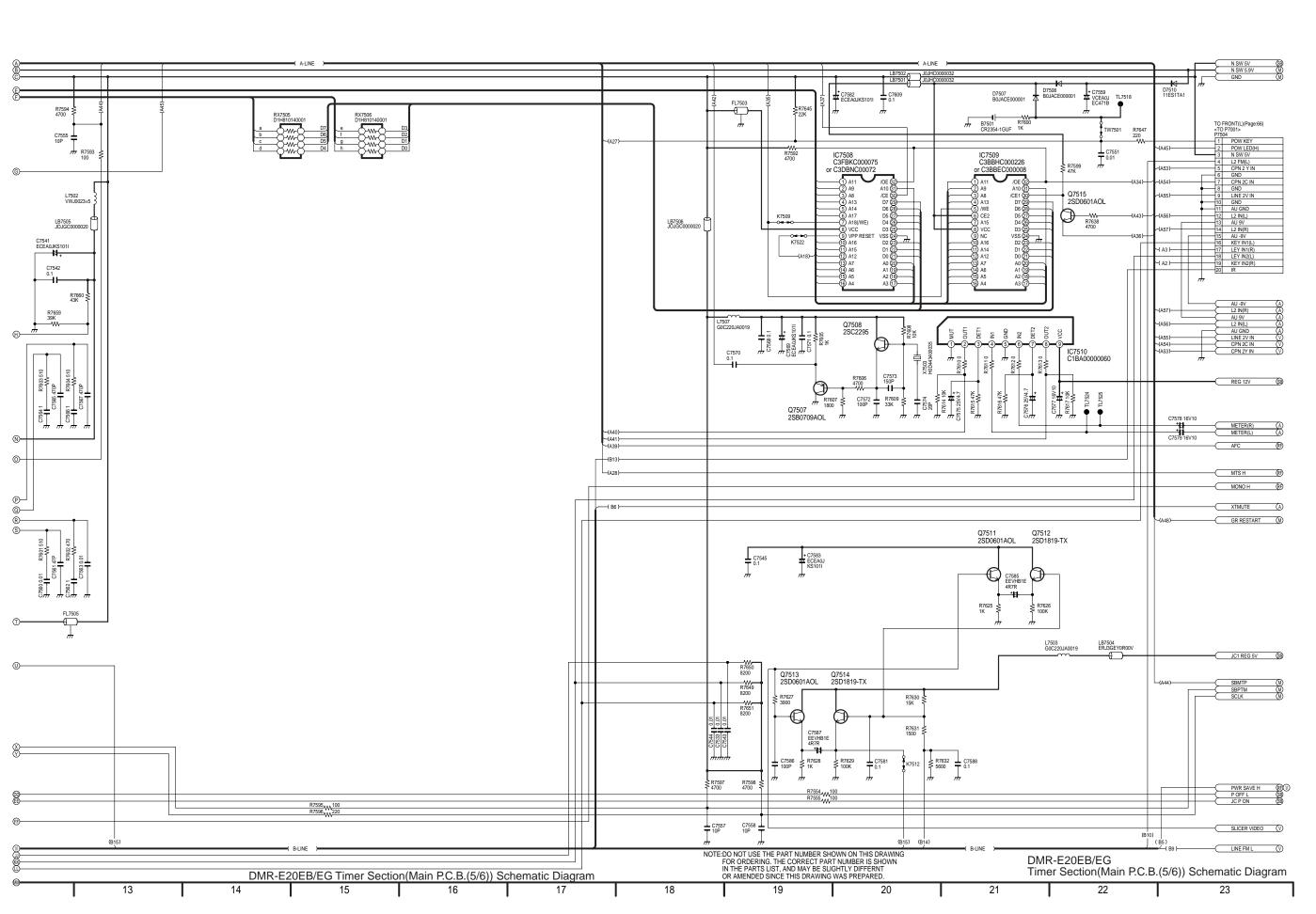
Ref No.								IC1506							IC1507					
MODE	1	2	3	4	5	6		1	2	3	4	5	6		1	2	3	4	5	6
REC	6.0	0	4.7	1.2	0	5.0		4.9	0	4.7	1.2	0	3.0		3.3	0	4.7	1.2	0	2.5
PLAY	6.0	0	4.7	1.2	0	5.0		4.9	0	4.7	1.2	0	3.0		3.3	0	4.7	1.2	0	2.5
STOP	6.0	0	4.7	1.2	0	5.0		4.9	0	4.7	1.2	0	3.0		3.3	0	4.7	1.2	0	2.5
Ref No.			IC1509							_	510						r		r	
MODE	1	2	3	4	5		1	2	3	4	5	6	7	8						
REC	1.2	0	4.7	14.6	12.0		0	-	3.1	-	-	3.2	5.0	3.2					-	-
PLAY	1.2	0	4.7	14.6	12.0		0	-	3.1	-	-	3.2	5.0	3.2						
STOP Ref No.	1.2	0	4.7 IC1	14.6 512	12.0		0	-	3.1	- IC1	513	3.2	5.0	3.2			<u> </u>		<u> </u>	
MODE	1	2	3	4	5	6		1	2	3	4	5	6			1				
REC	6.0	0	6.0	1.2	0	5.0		6.0	0	5.0	1.2	0	5.0							
PLAY	6.0	0	6.0	1.2	0	5.0		6.0	0	5.0	1.2	0	5.0							
STOP	6.0	0	6.0	1.2	0	5.0		6.0	0	5.0	1.2	0	5.0							
Ref No.										IC3	004						_			
MODE \	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	5.0	2.3	2.8	2.8	2.8	2.2	2.9	2.8	2.8	2.8	2.2	2.2	2.8	2.8	2.8	2.2	0	2.3	0	4.3
PLAY	5.0	2.2	2.8	2.8	2.8	2.2	2.8	2.8	2.8	2.8	2.2	2.2	2.8	2.8	2.8	2.2	0	2.3	0	4.3
STOP	5.0	2.3	2.8	2.8	2.8	2.2	2.9	2.8	2.8	2.8	2.2 004	2.2	2.8	2.8	2.8	2.2	0	2.3	0	4.3
Ref No. MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				\vdash
REC	4.2	0	1.4	1.4	0.8	1.6	2.1	2.1	2.1	2.1	2.7	2.9	2.8	2.7	2.7	2.8				
PLAY	4.2	0	1.4	1.4	0.8	1.6	2.1	2.1	2.1	2.1	2.7	2.9	2.8	2.7	2.7	2.8				
STOP	4.2	0	1.4	1.4	0.8	1.6	2.1	2.1	2.1	2.1	2.7	2.9	2.8	2.7	2.7	2.8	Ì			
Ref No.										IC3	005					•	•		•	•
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.0	4.9	2.7	0	2.7	4.9	0	0	0	0	4.9	2.7	0	2.7	4.9	2.0	2.2	2.0	2.2	0
PLAY	2.0	4.9	2.7	0	2.8	4.9	0	0	0	0	4.9	2.7	0	2.7	4.9	2.0	2.2	2.0	2.2	0
STOP	2.0	4.9	0	0	2.6	4.9	0	0	0	0	4.9	4.9	0	2.7	4.9	2.0	2.2	2.0	2.2	0
Ref No. MODE	21	22	23	24	25	26	27	28	29	30	005 31	32		Ī	Ī	I	r	1	r	_
REC	0	2.2	0	0	0	0	2.1	0	2.3	2.4	0	2.2								
PLAY	0	2.2	0	0	0	0	2.1	0	2.3	2.4	0	2.2								
STOP	2.1	2.1	0	0	0	0	1.9	0	2.1	2.1	0	2.2								
Ref No.	•	•	•							IC4	001	•		•	•	•	•		•	
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	4.0	4.4	4.0	4.6	4.6	0.1	5.1	4.0	4.6	4.0	4.6	4.6	0.1	5.1	4.0	4.6	4.0	4.6	4.6	0.1
PLAY	4.0	4.6	4.0	4.6	4.6	0.1	5.1	4.0	4.6	4.0	4.6	4.6	0.1	5.1	4.0	4.6	4.0	4.6	4.6	0.1
STOP	4.0	4.6	4.0	4.6	4.6	0.1	5.1	4.0	4.6	4.5	4.6	4.6	0.1	5.1	4.0	4.6	4.0	4.6	4.6	0.1
Ref No. MODE	21	22	22	24	25	20	27	20	20	IC4		22	22	34	25	20	27	20	20	40
REC	5.1	4.6	23 4.0	4.6	25 9.2	26 4.3	4.1	28 4.6	29 4.5	30 4.6	31 3.6	32 4.6	33 3.6	9.2	35 0	36 4.0	37 4.6	38 4.6	39 4.6	3.7
PLAY	5.1	4.6	4.0	4.6	9.2	4.3	4.1	4.6	4.5	4.6	3.6	4.6	3.6	9.2	0	4.0	4.6	4.6	4.6	3.7
STOP	5.1	4.6	4.0	4.6	9.2	4.3	4.1	4.6	4.5	4.6	3.6	4.6	3.6	9.2	0	4.0	4.6	4.6	4.6	3.7
Ref No.										IC4						-				
MODE	41	42	43	44	45	46	47	48												
REC	4.6	3.7	3.3	0	4.5	4.6	4.0	4.6												
PLAY	4.6	3.7	3.3	0	4.5	4.6	4.0	4.6											<u> </u>	
STOP	4.6	3.7	3.3	0	4.5 004	4.6	4.0	4.6			IC4005		-			L	<u> </u>		<u> </u>	
Ref No. MODE	1	2	3	4	5	6	7	8		1	2	3	-			1				\vdash
REC	0	0	0	0.7	0	1.4	8.4	9.2		2.5	0	5.8	-							
PLAY	8.4	1.8	0	0.7	0	1.8	8.4	9.2		2.5	0	5.7								
STOP	0	0	0	-9.0	0	0	0	9.2		2.5	0	5.8				ì	Ì			
Ref No.					006								IC4	007						
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8			
REC	8.4	3.0	0.3	0.7	0.3	3.0	8.0	9.2		8.4	3.0	0.3	0.7	0.3	3.0	8.4	9.2			
PLAY	8.4	3.0	0.3	0.7	0.3	3.0	8.0	9.2		8.4	3.0	0.3	0.7	0.3	3.0	8.4	9.2			igsquare
STOP	0	0	0	-9.0	0	0	0	9.2		0	0	0	-9.0	0	0	0	9.2		<u> </u>	\Box
Ref No.	, ,	^		_	.009		-				_	_		010	_	-	_ ^		Т	-
MODE	1 0 4	2	3	4	5	6	7	8		1 0 1	2	3	4	5	6	7	8			
REC PLAY	8.4 8.4	2.9	0.2	0.7	0.2	2.9	8.4 8.4	9.2		8.4 8.4	0.2	0	0.7	8.4 8.4	8.4 8.4	8.4 8.4	9.2 9.2		-	\vdash
STOP	0.4	0	0.2	-9.0	0.2	0	0.4	9.2		0.4	0.2	0	-9.0	0.4	0	0.4	9.2		1	\vdash
5151	Ū	Ü	Ū	0.0	Ü	Ü	Ü	٥.٢		Ū	Ü	Ŭ	0.0	Ü	Ü	Ü	0.2			

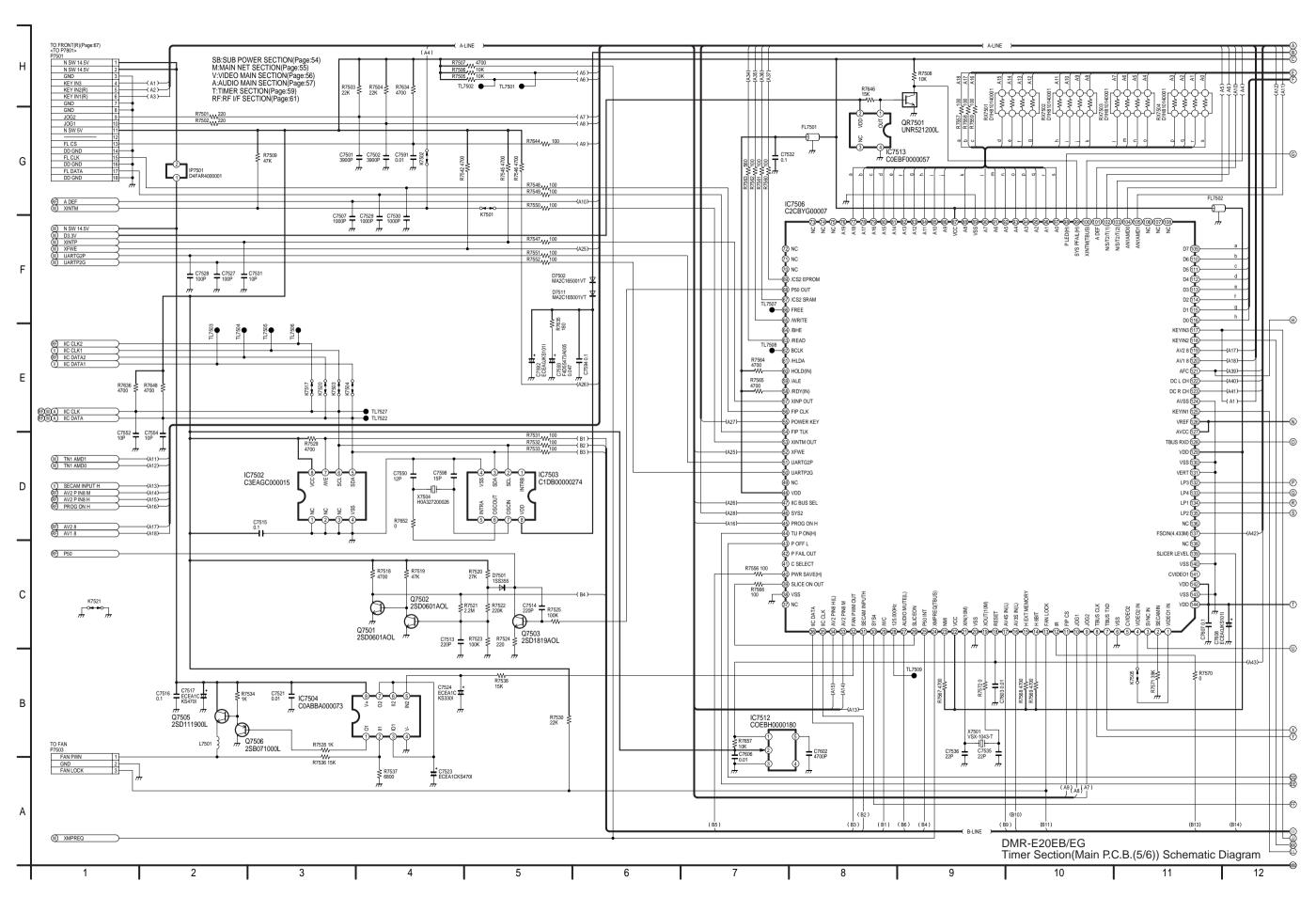
			MAIN	P.C.B.			
Transistor		Transistor -	resistors	IC7510	D-7 C	TL7529	B-4 F
Q3001	D-2 C	QR1501	D-1 F	IC7512	B-6 C	TL7530	B-3 F
Q3002	D-2 C	QR4001	E-1 F	IC7513	A-6 C	TL7531	C-2 F
Q3003	D-6 F	QR4002	E-1 F	IC9901	C-6 C	TL7532	A-7 F
Q3004	D-6 F	QR4003	E-1 F	IC9902	C-6 C	TL7533	C-5 F
Q3005	D-6 F	QR4004	E-1 F	Test Points		TL7534	B-6 F
Q3006	C-2 C	QR4005	E-1 F	TL1501	C-3 F	TL9901	D-4 F
Q4003	E-7 C	QR4008	E-6 C	TL1502	C-3 F	TL9902	D-4 F
Q4004	E-7 C	QR7404	E-1 C	TL1503	C-7 F	TL9903	D-4 F
Q4005	E-1 C	QR7501	A-6 C	TL1504	D-1 F	TL9904	D-4 F
Q4006	E-7 C	Integrated C	ircuits	TL1505	D-4 F	TL9905	D-4 F
Q4007	E-1 F	IC1502	C-2 C	TL3707	B-3 C	TL9906	D-4 F
Q4008	E-1 F	IC1504	C-2 C	TL3708	B-3 C	TL9907	D-4 F
Q4009	F-4 F	IC1505	C-7 C	TL4001	E-1 F	TL20009	B-3 C
Q4010	F-3 F	IC1506	D-8 C	TL7401	E-8 F	Connector	•
Q4017	F-4 F	IC1507	D-7 C	TL7402	F-8 F	P7501	A-3 C
Q4018	E-5 C	IC1509	C-8 C	TL7403	D-7 F	P7503	E-7 C
Q4019	E-6 C	IC1510	C-5 C	TL7404	E-7 F	P7504	A-2 C
Q4020	E-6 C	IC1511	B-4 C	TL7405	D-7 F	PP3001	F-5 C
Q4021	E-1 F	IC1513	C-1 C	TL7406	D-7 F	PP3002	F-5 C
Q4022	E-5 C	IC3002	D-6 F	TL7501	A-1 C	PP3003	F-4 C
Q4024	F-3 F	IC3004	E-5 F	TL7502	A-1 C	PP4001	F-6 C
Q4025	E-4 F	IC3706	C-3 C	TL7503	F-3 C	PP7403	F-2 C
Q4026	E-4 F	IC4001	E-4 C	TL7504	F-6 F	PP9901	D-5 C
Q4028	E-1 F	IC4002	F-8 C	TL7505	F-3 C	PP9902	A-8 C
Q4029	F-7 C	IC4003	E-5 F	TL7506	F-6 F		
Q4030	F-7 C	IC4004	E-3 F	TL7507	B-5 C		
Q7402	E-7 F	IC4005	E-7 C	TL7508	B-5 C		
Q7407	B-1 C	IC4006	F-4 F	TL7509	B-2 F		
Q7408	B-1 C	IC4007	F-4 F	TL7510	B-3 F		
Q7409	B-1 C	IC4010	E-4 F	TL7511	B-3 F		
Q7501	B-5 C	IC4011	E-3 F	TL7512	B-2 F		
Q7502	B-5 C	IC4012	E-5 C	TL7513	B-2 F		
Q7503	B-5 C	IC4015	F-8 C	TL7514	B-6 C		
Q7504	B-2 F	IC4016	F-7 C	TL7515	B-6 C		
Q7505	A-2 F	IC7401	E-2 C	TL7516	B-6 C		
Q7506	A-2 F	IC7403	B-7 F	TL7517	B-3 F		
Q7507	A-6 C	IC7404	E-1 C	TL7518	A-6 F		
Q7508	A-3 C	IC7502	B-3 C	TL7521	B-6 C		
Q7511	C-6 C	IC7503	C-6 C	TL7522	B-6 F		
Q7512	C-6 C	IC7504	A-2 F	TL7523	B-2 F		
Q7513	C-3 F	IC7505	B-7 C	TL7524	D-7 C		
Q7514	C-6 C	IC7506	B-5 C	TL7525	D-7 C		
Q7515	B-4 F	IC7508	B-4 C	TL7527	F-4 C		
Q7516	C-3 F	IC7509	B-4 C	TL7528	A-2 F		
ADDRESS IN CCOMPO FFOIL SID		1					

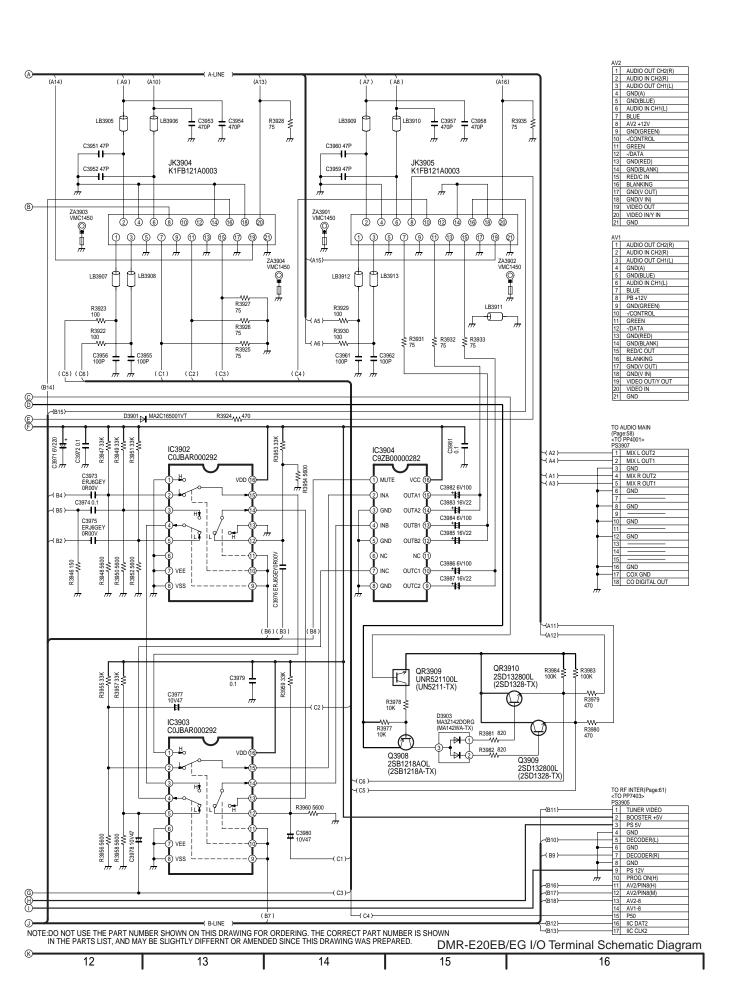
Ref No.																				
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	5.5	5.5	0.1	0.1	1.5	0	2.2	0	0	5.5	5.5	4.9	2.2	12.0	5.5	5.5	0	2.2	3.5	0
PLAY	5.5	5.5	0.1	0.1	1.5	0	2.2	0	0	5.5	5.5	4.9	2.2	12.0	5.5	5.5	0	2.2	3.5	12.0
STOP	5.5	5.5	0.1	0.1	1.1	0	2.2	0	0	5.5	5.5	4.9	2.2	12.0	5.5	5.5	0	2.2	3.5	0
Ref No.										IC3	901									
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	4.2	4.5	1.8	5.0	2.0	2.0	0	1.8	5.0	4.9	4.9	-	5.5	5.5	5.0	5.5	5.5	-	4.9	4.9
PLAY	4.2	4.3	1.8	5.0	2.0	2.0	0	1.8	5.0	4.9	4.9	-	5.5	5.5	5.0	5.5	5.5	-	4.9	4.9
STOP	4.2	4.5	1.8	5.0	2.0	2.0	0	1.8	5.0	4.9	4.9	-	5.5	5.5	5.0	5.5	5.5	-	4.9	4.9
Ref No.		IC3	901																	
MODE \	61	62	63	64																
REC	4.9	4.9	4.9	0																
PLAY	0	4.9	4.9	0																
STOP	0	4.9	4.9	0																<u> </u>
Ref No.											902									
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			.	
REC	0	0.7	0.7	0.7	0.7	0	0	0	0.1	0.1	0.1	0.7	0	0.7	0.7	5.0			.	
PLAY	0	0.7	0.7	0.7	0.7	0	0	0	0.1	0.1	0.1	0.7	0	0.7	0.7	5.0				
STOP	0	0.7	0.7	0.7	0.7	0	0	0	0.1	0.1	0.1	0.7	0	0.7	0.7	5.0				Щ
Ref No.											903									
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
REC	0.7	0.7	0.7	0.7	0.7	0	0	0	0.1	0.1	0.1	0.7	0.7	0.7	0.7	5.0				
PLAY	0.7	0.7	0.7	0	0.7	0	0	0	0.1	0.1	0.1	0.7	0.7	0.7	0.7	5.0				
STOP	0.7	0.7	0.7	0.7	0.7	0	0	0	0.1	0.1	0.1	0.7	0.7	0.7	0.7	5.0				
Ref No.			_								904									
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
REC	0	0.7	0	0.7	0	-	0.7	0	2.3	2.3	-	2.3	2.3	2.3	2.3	5.0				
PLAY	0	0	0.7	0.7	0	-	0.7	0	2.3	2.4	-	2.3	2.3	2.3	2.3	5.0				
STOP	0	0.7	0	0.7	0	-	0.7	0	2.3	2.3	2.3	2.3	2.3	2.3	2.3	5.0				
D-(N)		02004				02002				02005			1	02000				072007	,	1
Ref No.	Е	Q3901	2		-	Q3902	_		_	Q3905	-		E	Q3906	-		-	Q73907		
MODE		C	B		E	C	B		E	C	В			C	B		E	C	B 0	
REC PLAY	2.2	0	1.5		2.2	0	1.5 1.5		1.5	1.6	0		5.0 5.0	1.3	5.0 5.0	-	0	12.0 12.0	0	
STOP	2.2	0	1.5 1.6		2.2	0	1.6		0.3	0.4	0		5.0	1.1 0.9	5.0	1	0	12.0	0	\vdash
Ref No.	۷.۷	Q3908	1.0		۷.۷	Q3909	1.0		0.3	Q3910	U		5.0	0.9	5.0		U	12.0	U	
MODE	Е	C C	В		Е	C C	В		Е	C C	В									-
REC	5.0	-0.6	5.0		0	0	-0.1		0	0	-0.1									
PLAY	5.0	-1.1	5.0		0	0	-0.1		0	0	-0.1									
STOP	5.0	-0.8	5.0		0	0	-0.1		0	0	-0.1					1	1		1	\vdash
3105	5.0	-0.0	5.0		U	U	-0.1	ı	U	U	-0.1		L							
Ref No.		QR3901				QR3902				QR3903			1	QR3904		1	1	QR3905	5	П
MODE	Е	C	В		Е	C	В		Е	C	В		Е	C	В	1	Е	C	В	
REC	0	0	0		0	0	0		0	0	0		0	4.1	0	1	0	0	4.1	
PLAY	0	0	4.5		0	0	5.0		0	4.1	0		0	4.1	0	1	0	0	4.1	\vdash
STOP	0	0	0		0	0	0		0	0	0		0	4.1	0	1	0	0	4.1	\vdash
Ref No.		QR3906	-			QR3907			Ť	QR3908			Ť	QR3909		1	·	Ŭ	7.1	-
MODE	Е	C	В		E	C	В		Е	C	В		Е	C	В	1				
REC	0	12.0	0		12.0	-0.3	12.0		0	0	3.5		0	5.0	0	1	1	1	1	
PLAY	0	0	4.1		12.0	12.0	0		0	0	3.5		0	5.0	0	1	1	1	1	\vdash
STOP	0	12.0	0		12.0	-0.6	12.0		0	0	3.5	-	0	5.0	0	 	 	 	 	+
STOF	U	12.0	U		12.0	-0.0	12.0		U	U	ა.ა		U	J.U	U	1		<u> </u>	<u> </u>	I

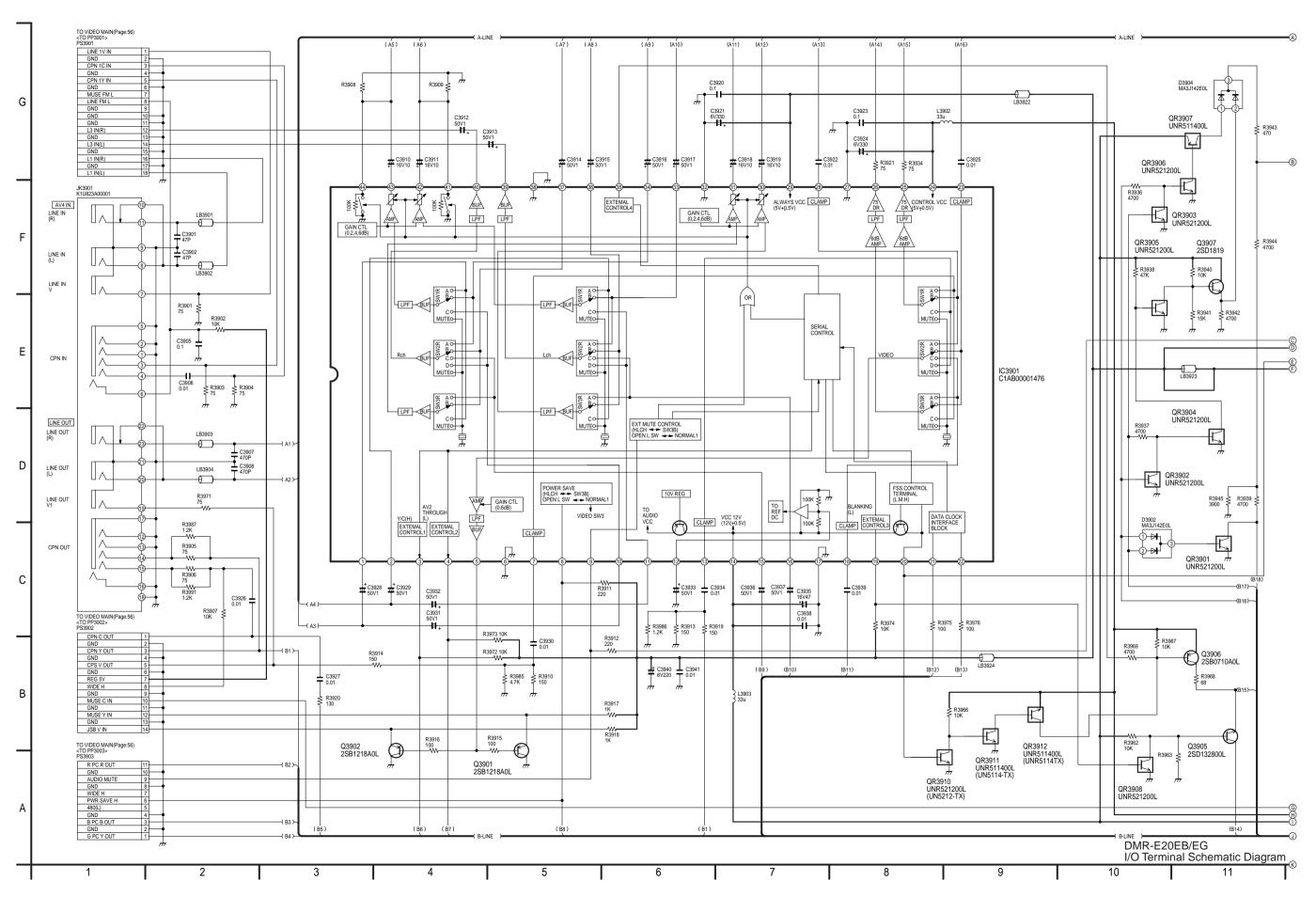


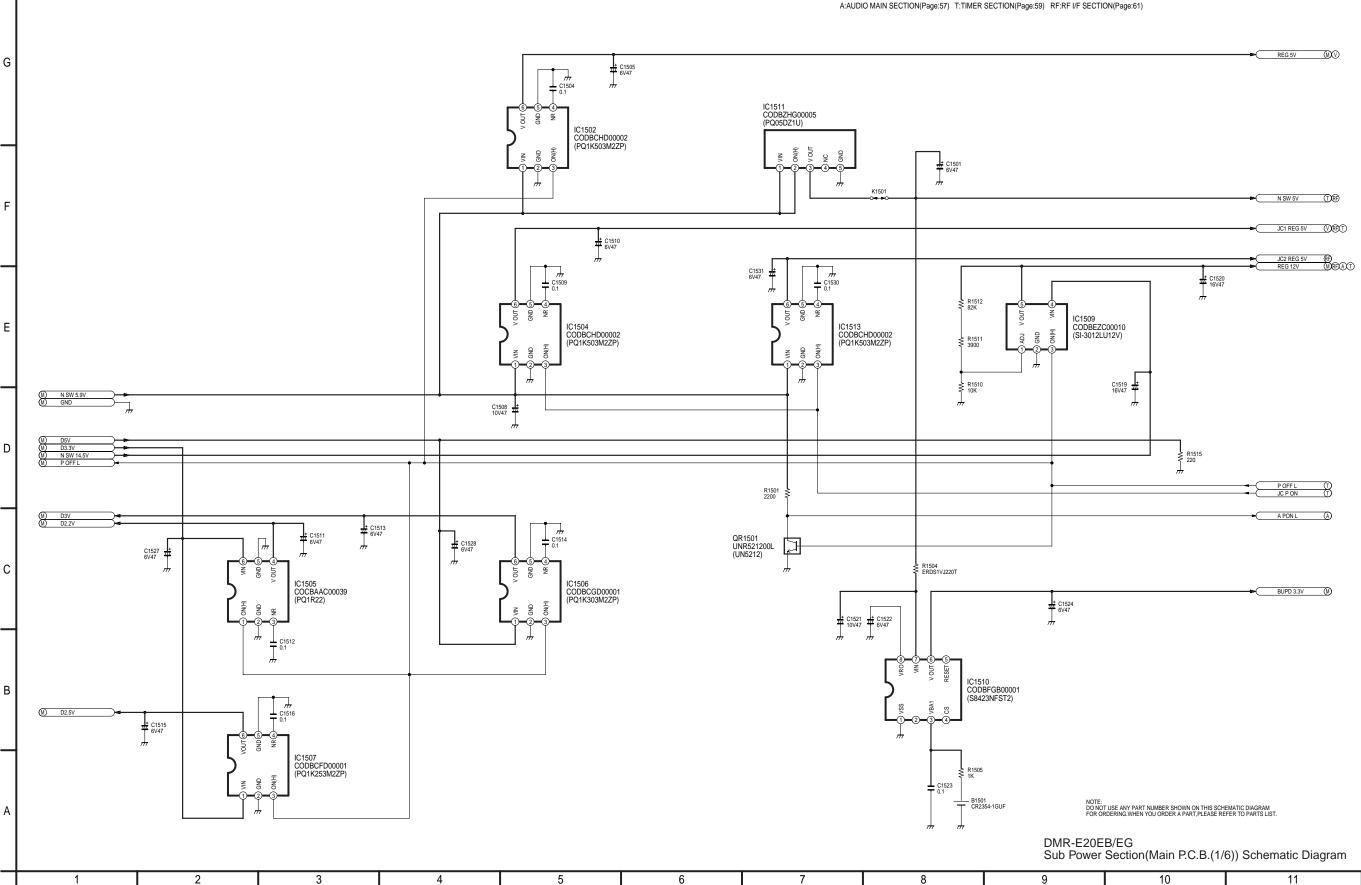


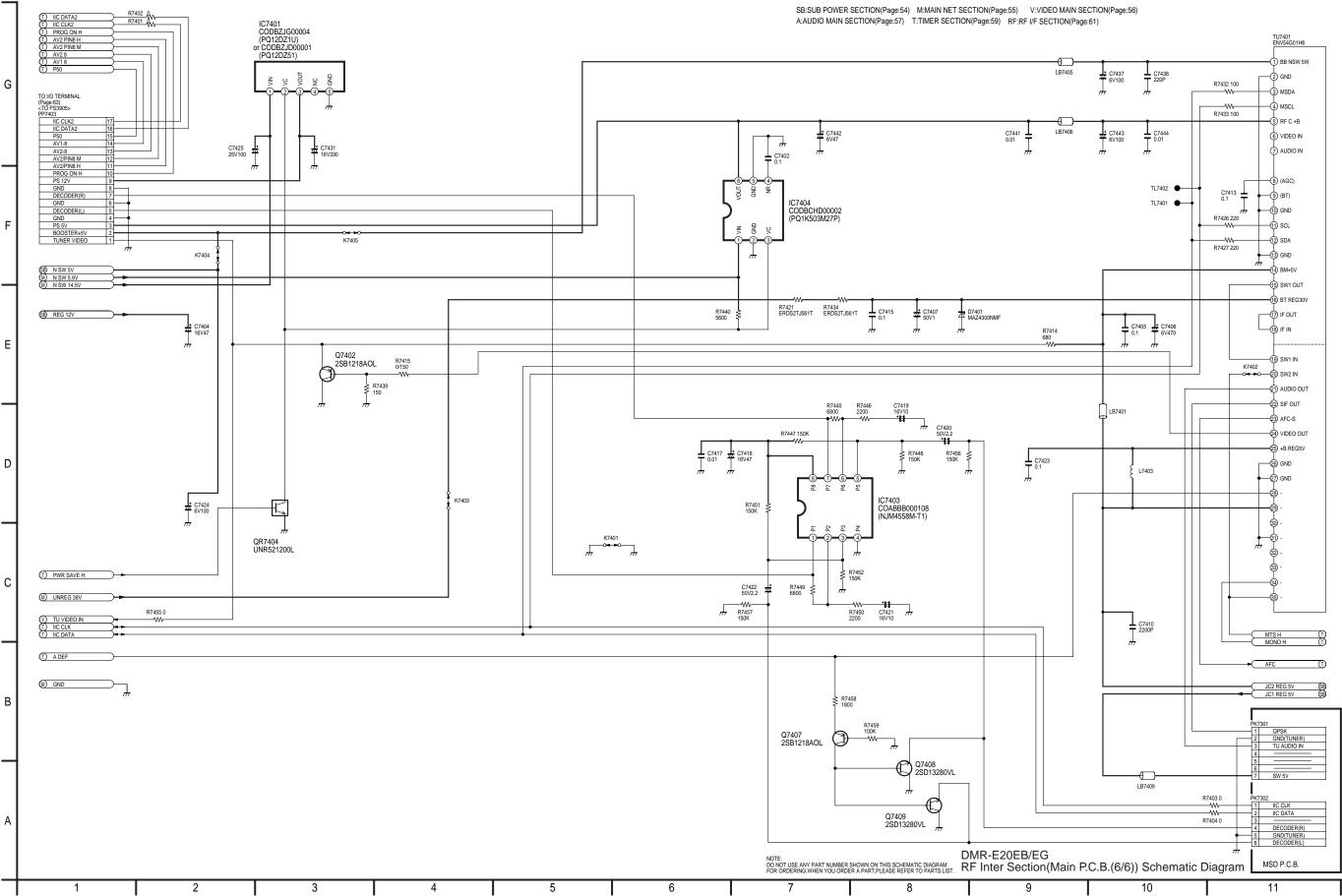


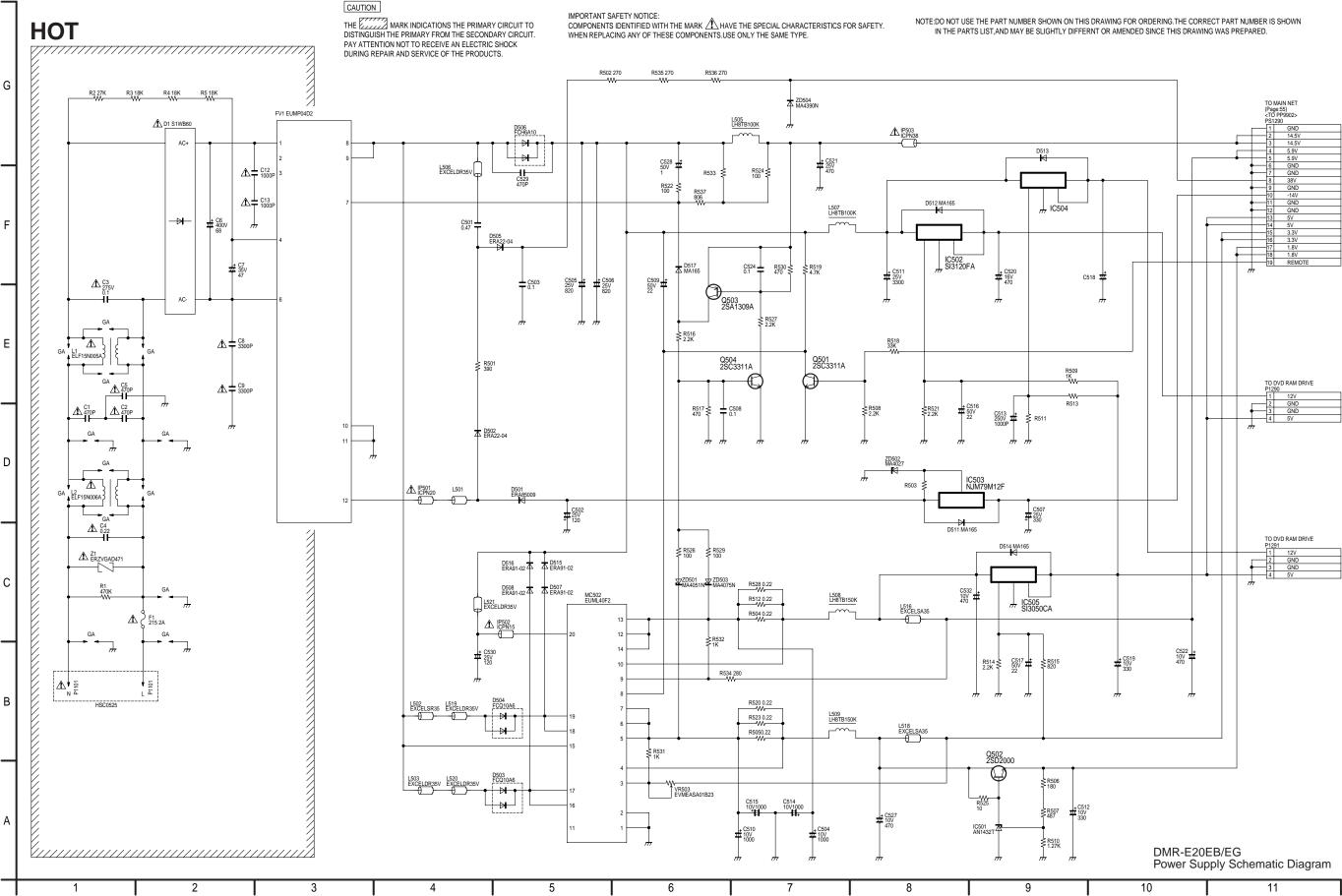


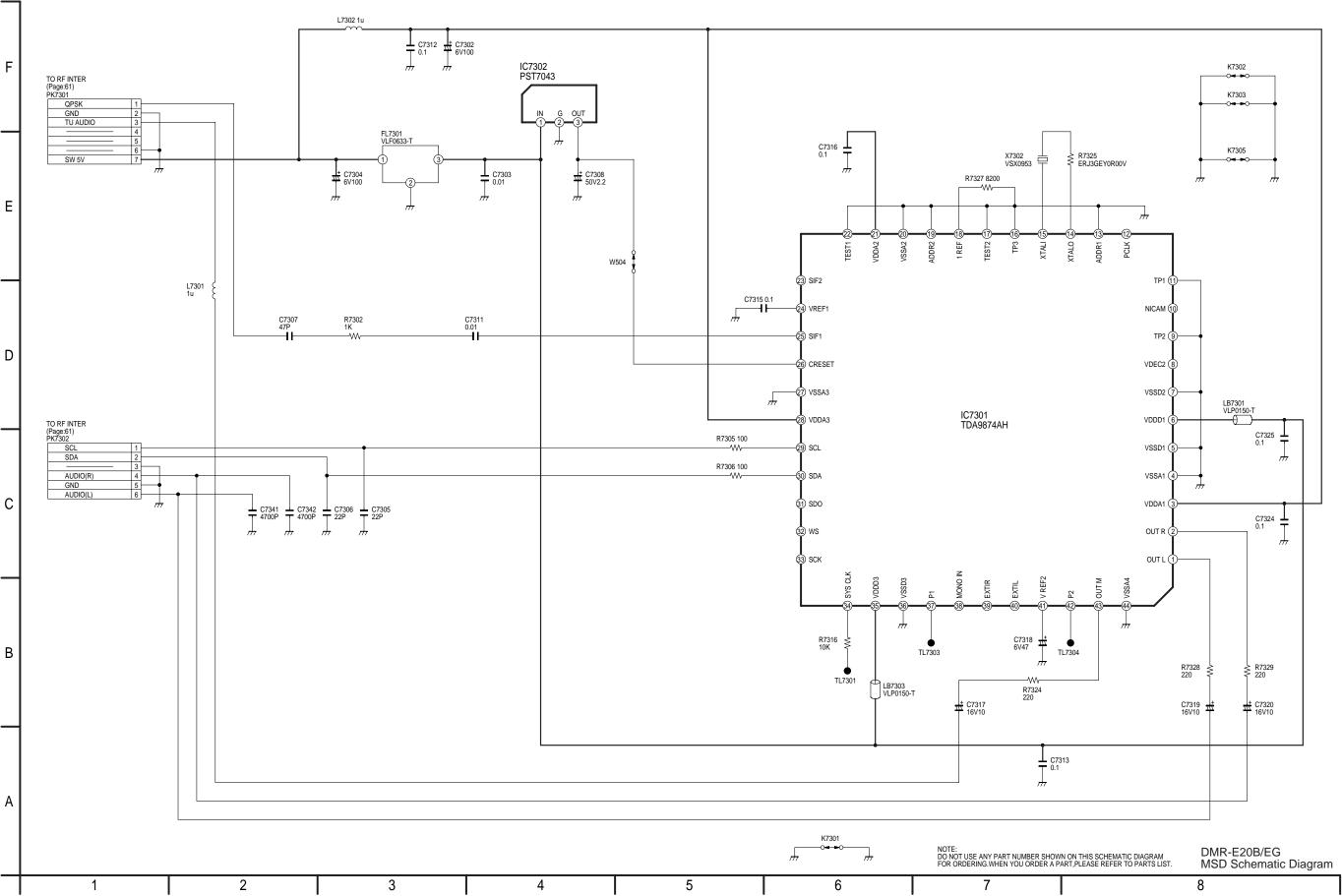


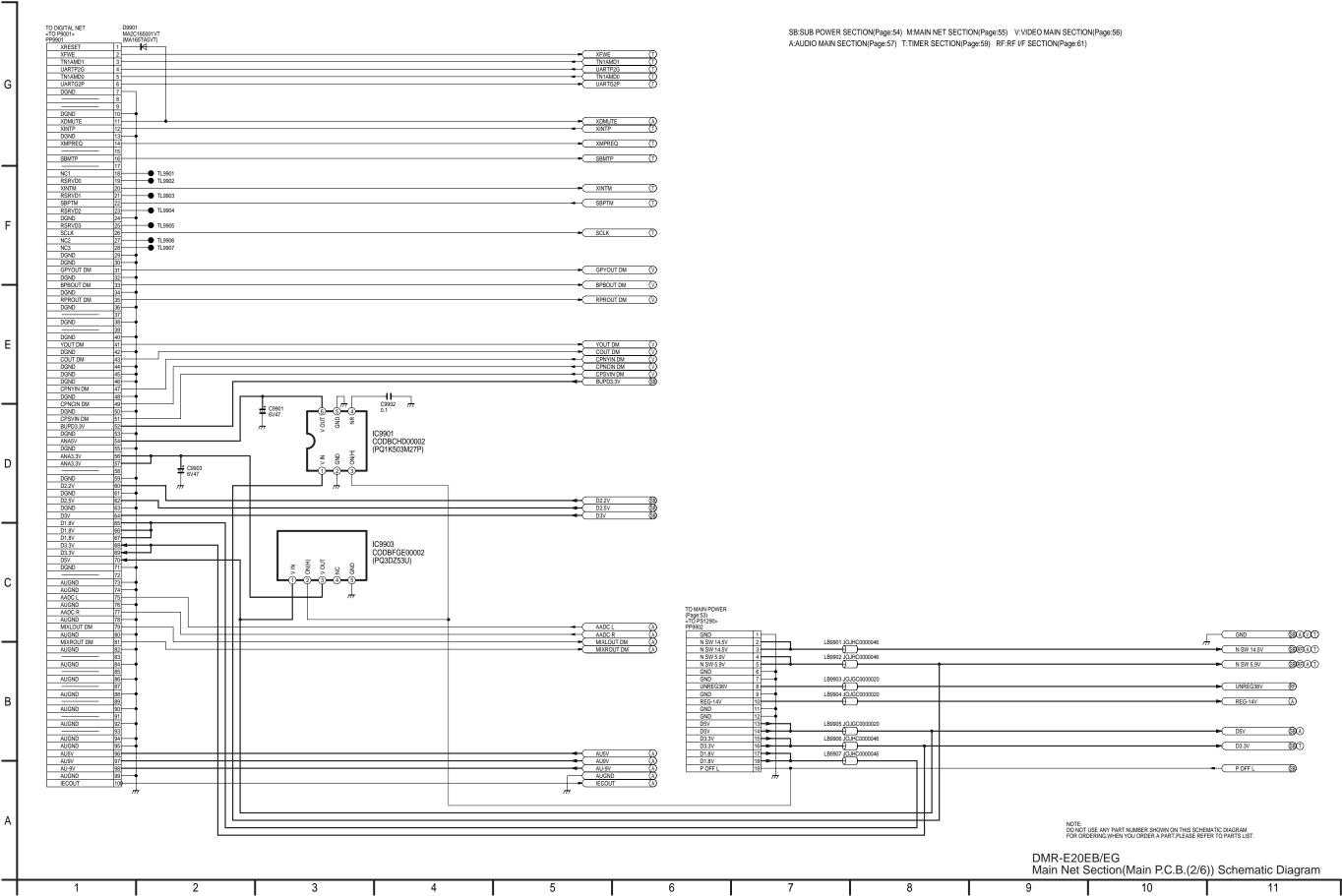


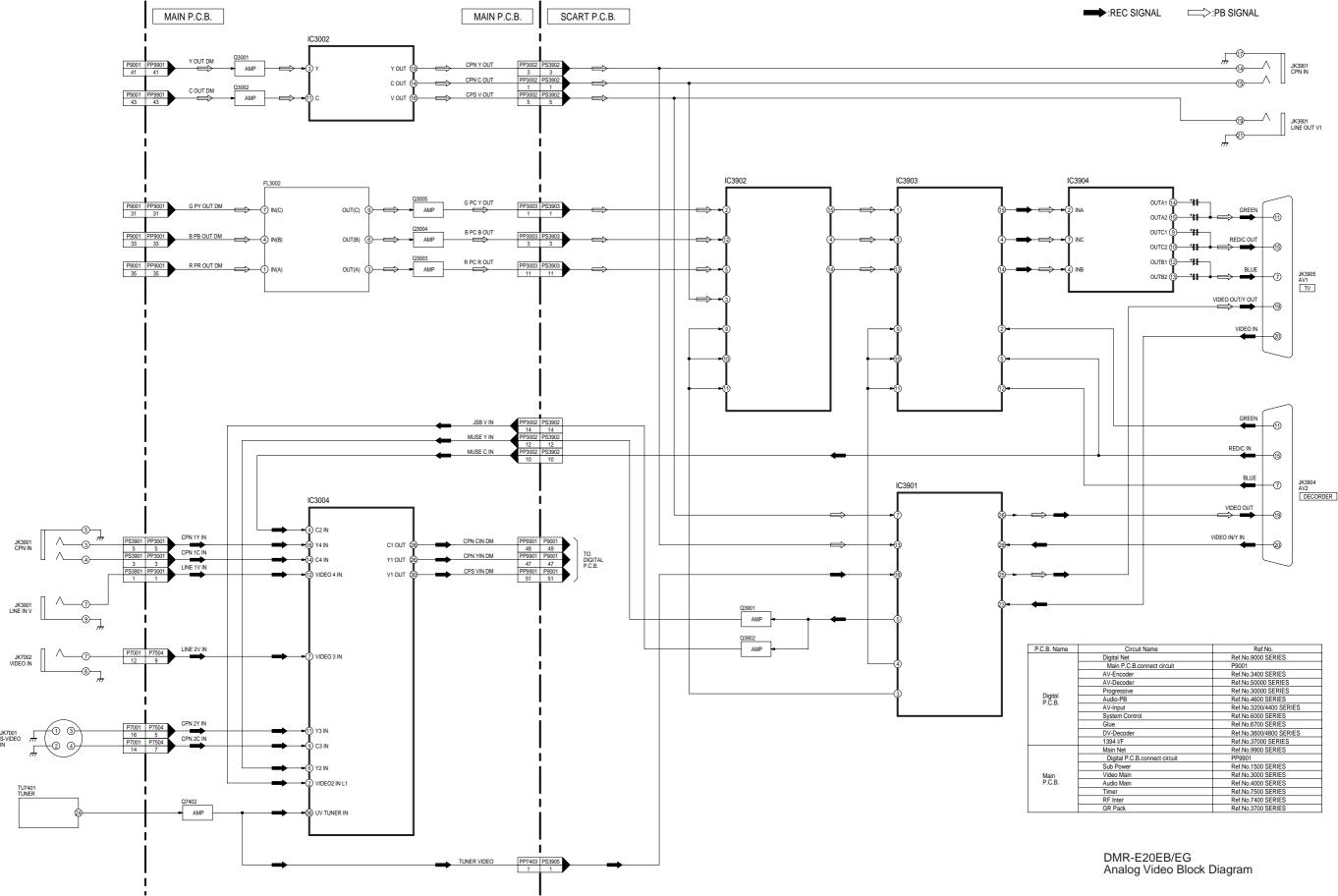


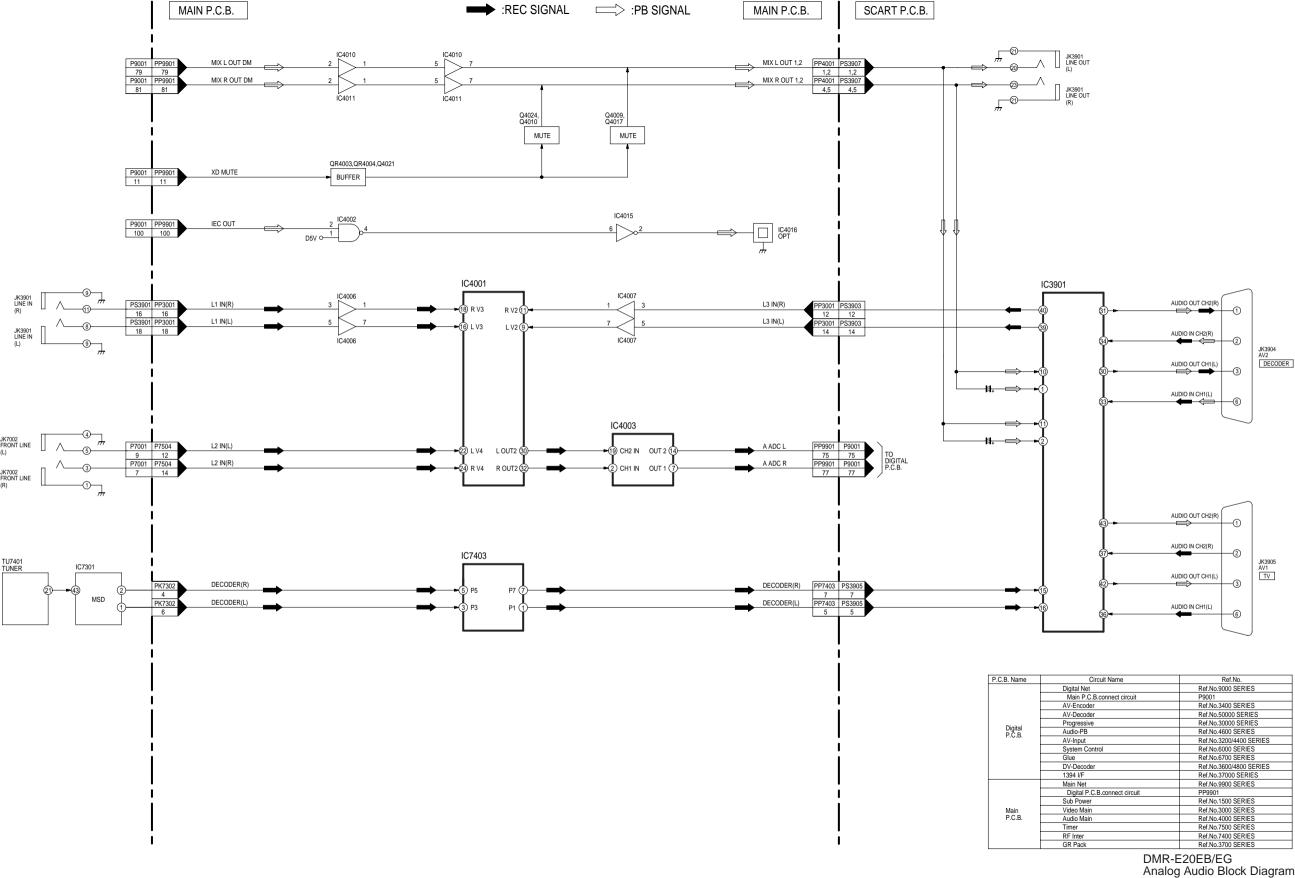


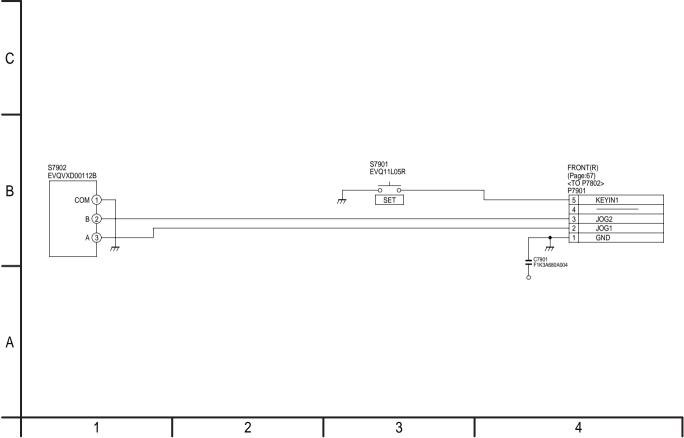


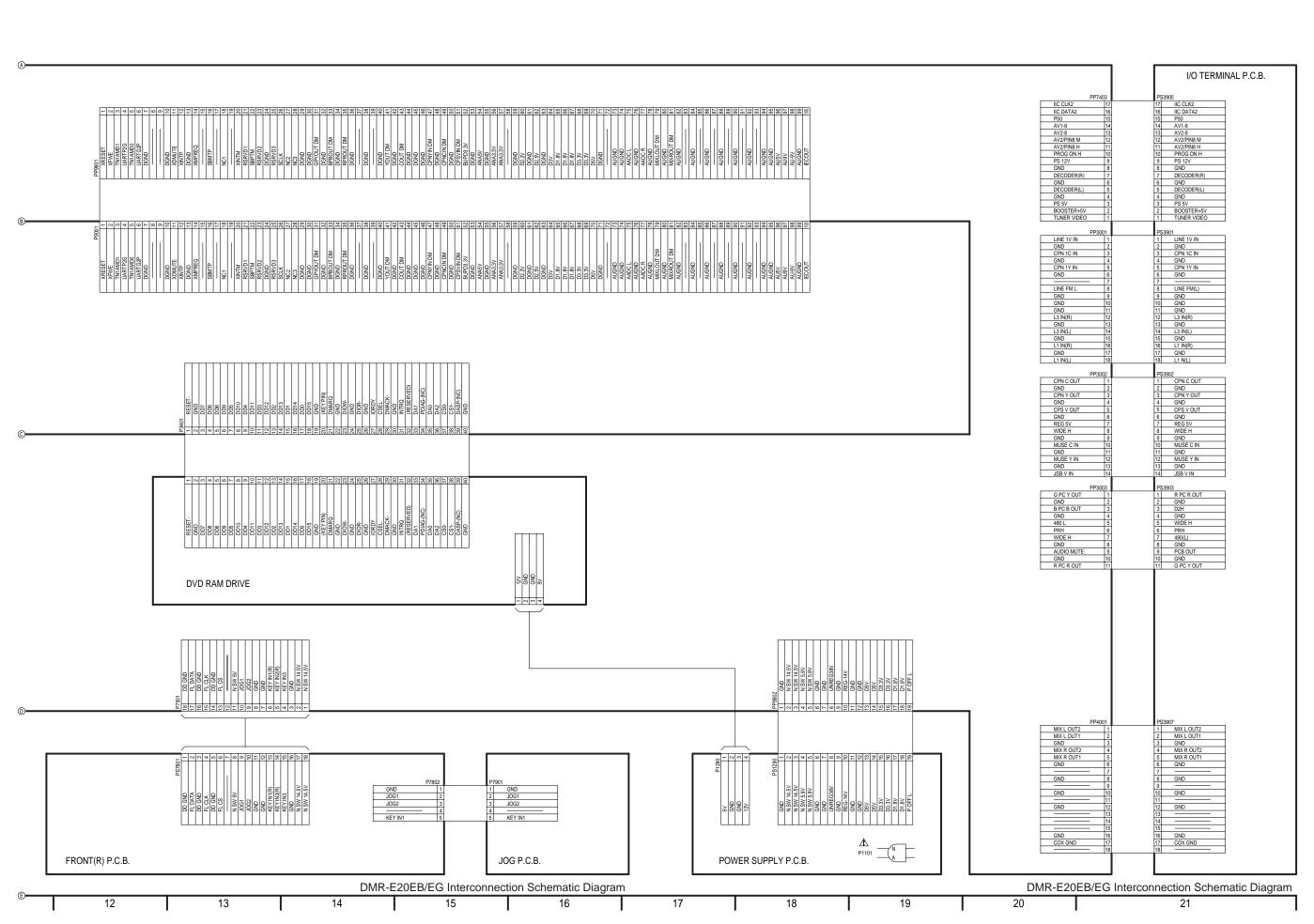


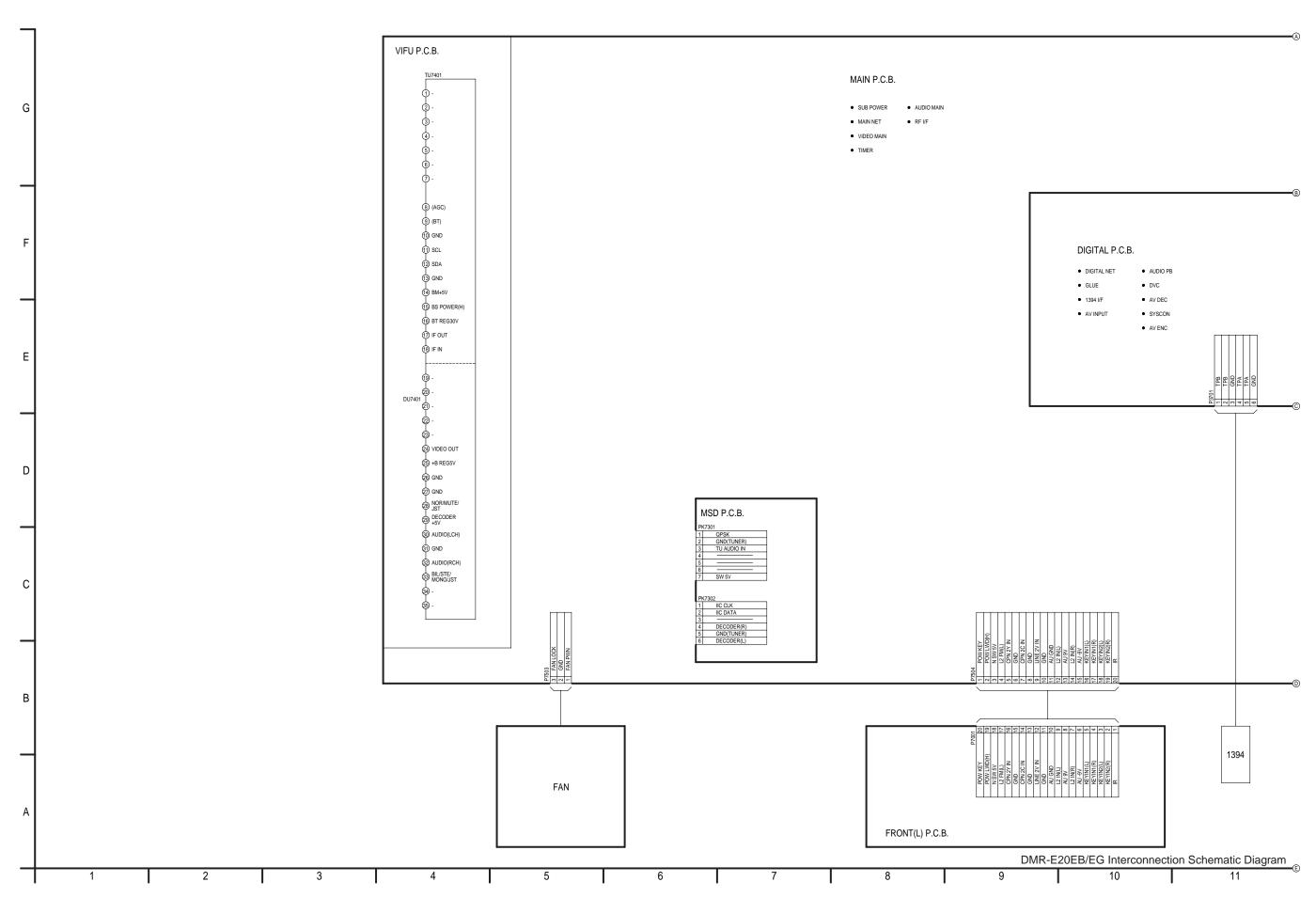


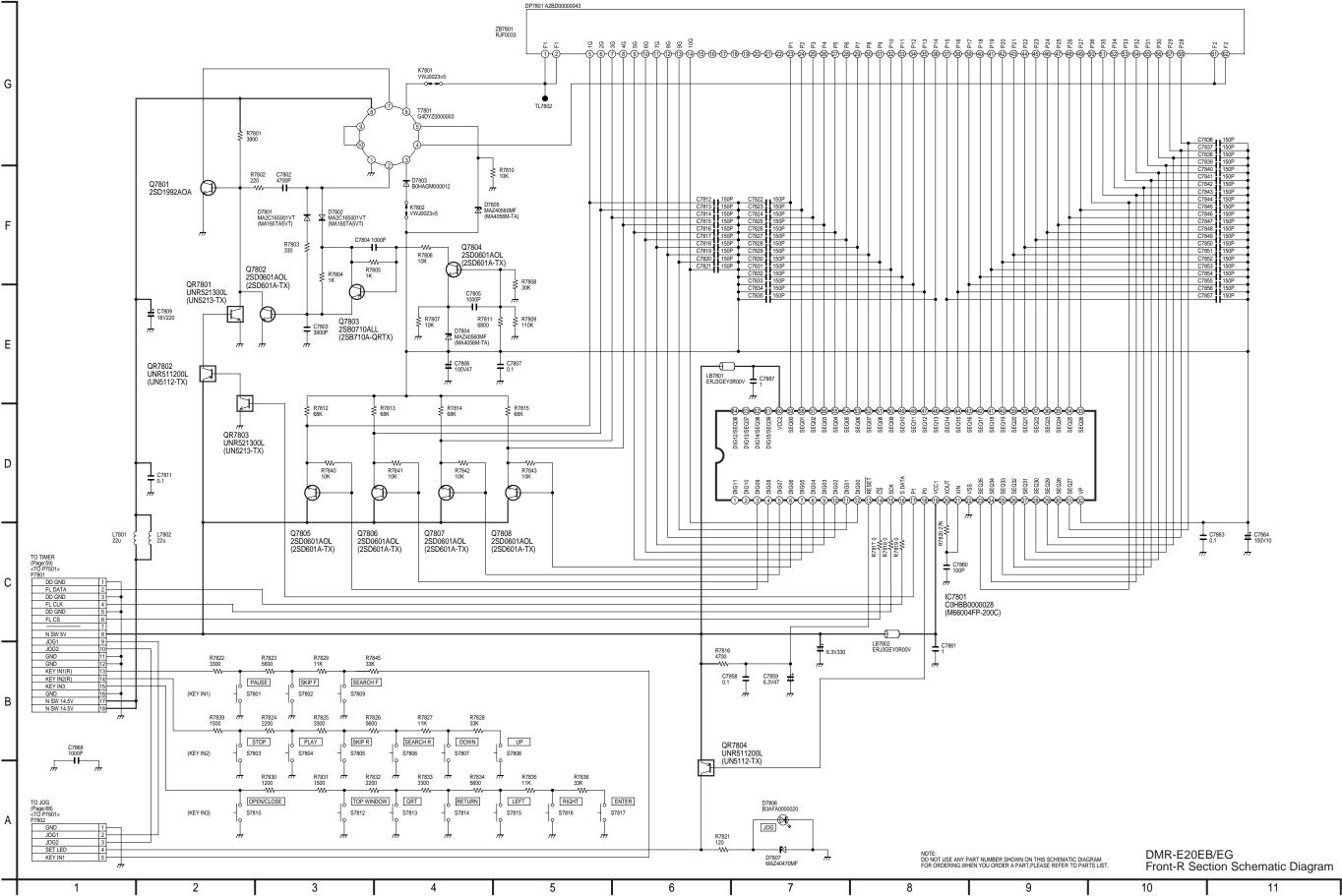


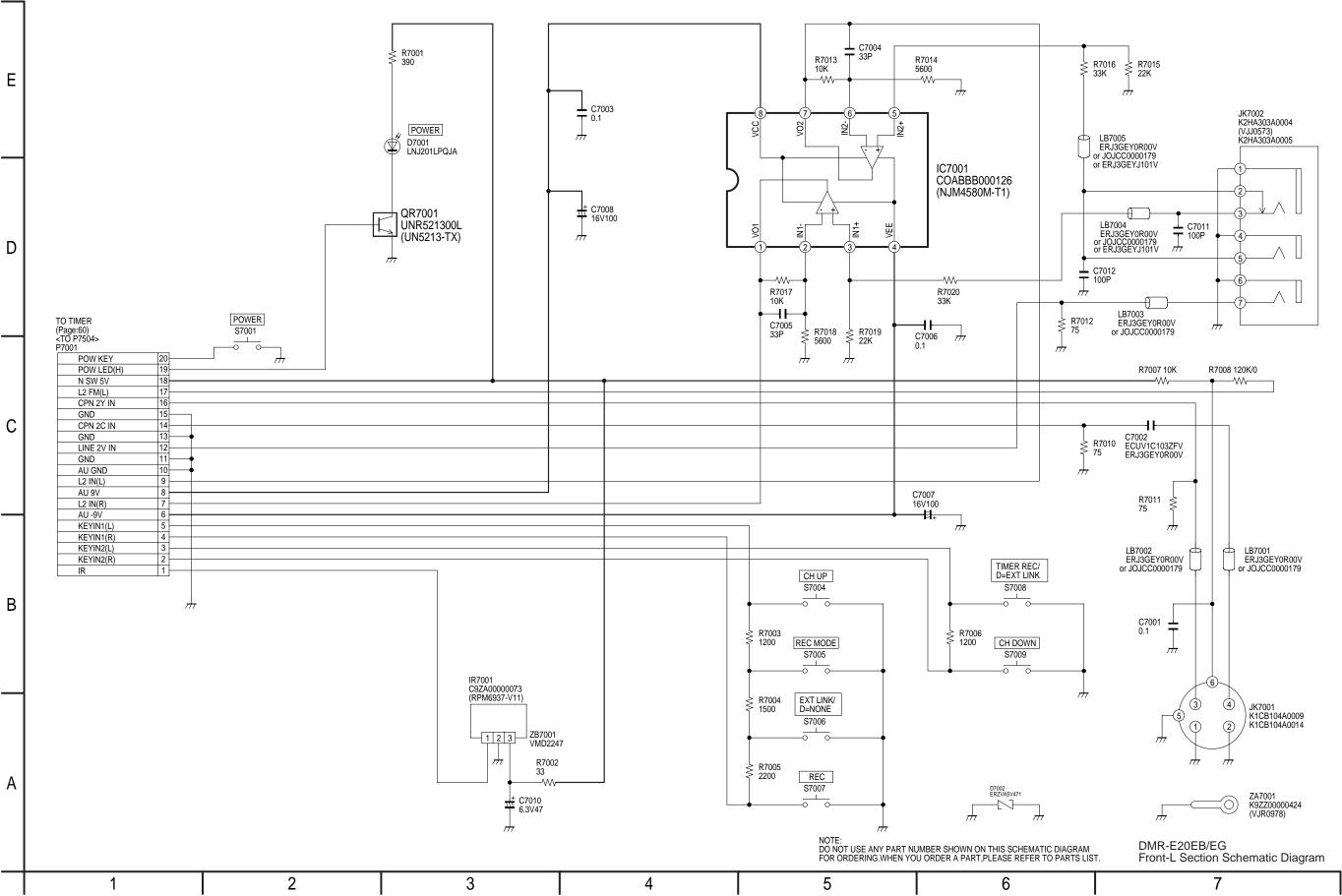


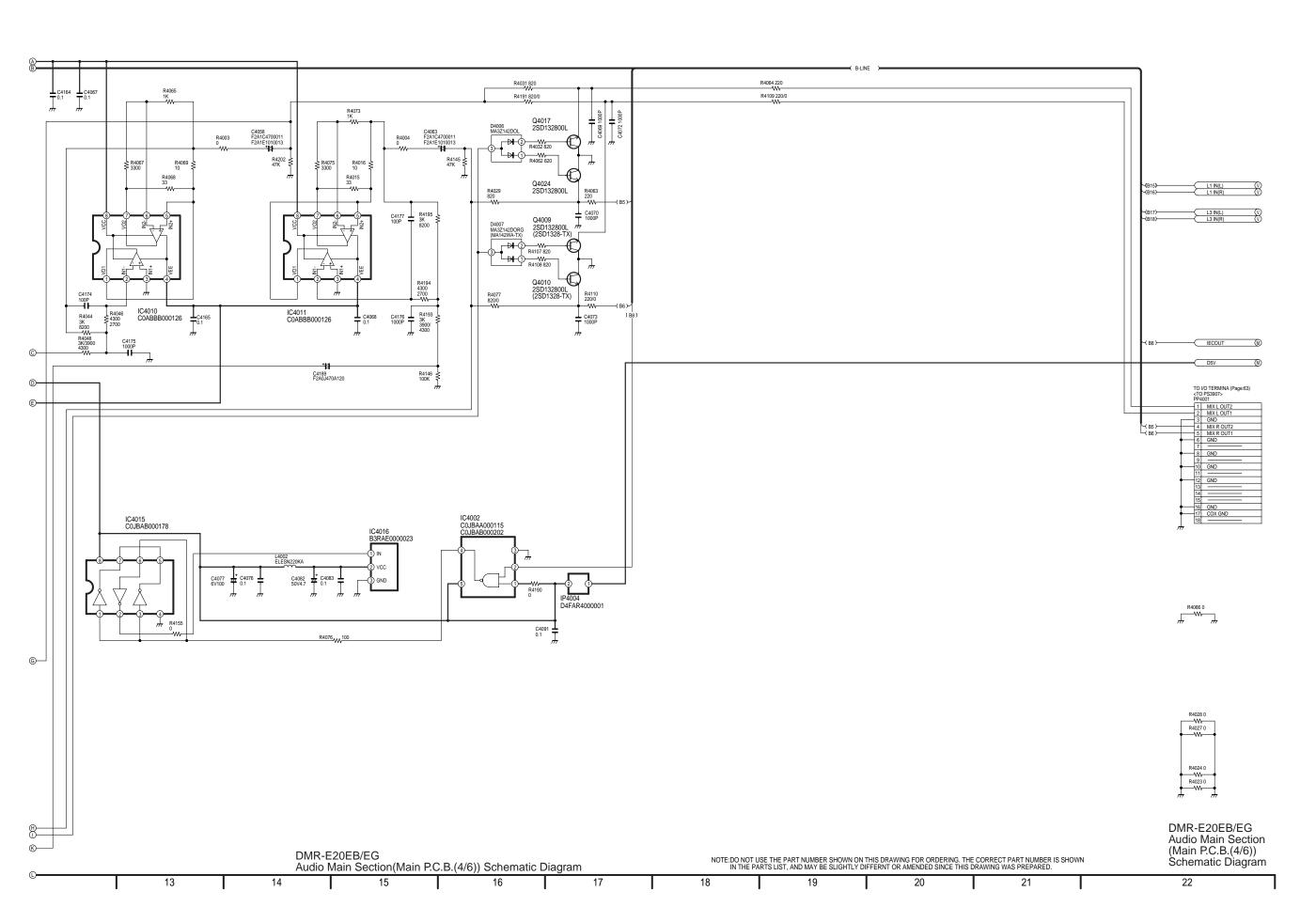


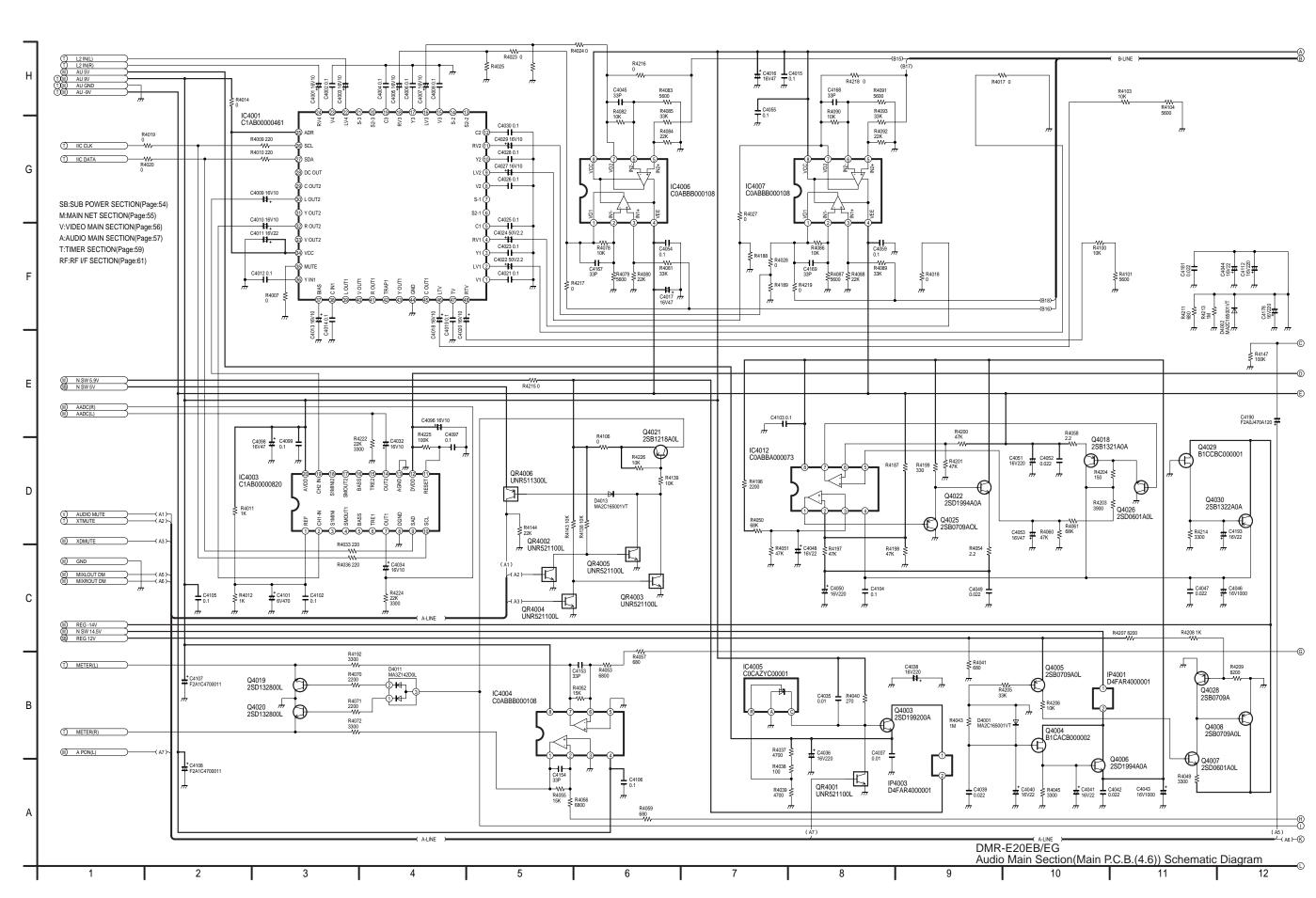












VIFU P.C.B.			
Transistor		Connector	
Q701	A-3	PK701	A-1
Q702	A-2	PP701	A-1
Transistor-resistor			
Transistor	-resistor	Volu	ume
Transistor QR707	resistor C-3	Volu VR701	ume C-1
	C-3		

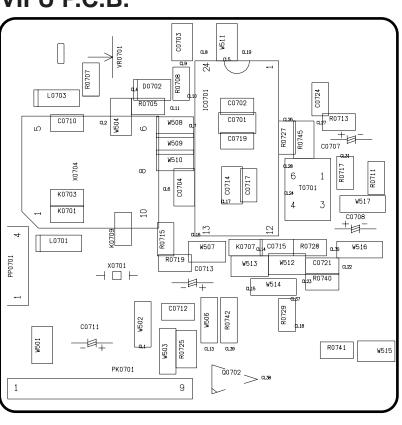
ADDRESS INFORMATION

VIFU P.C.B.

C

В

Α



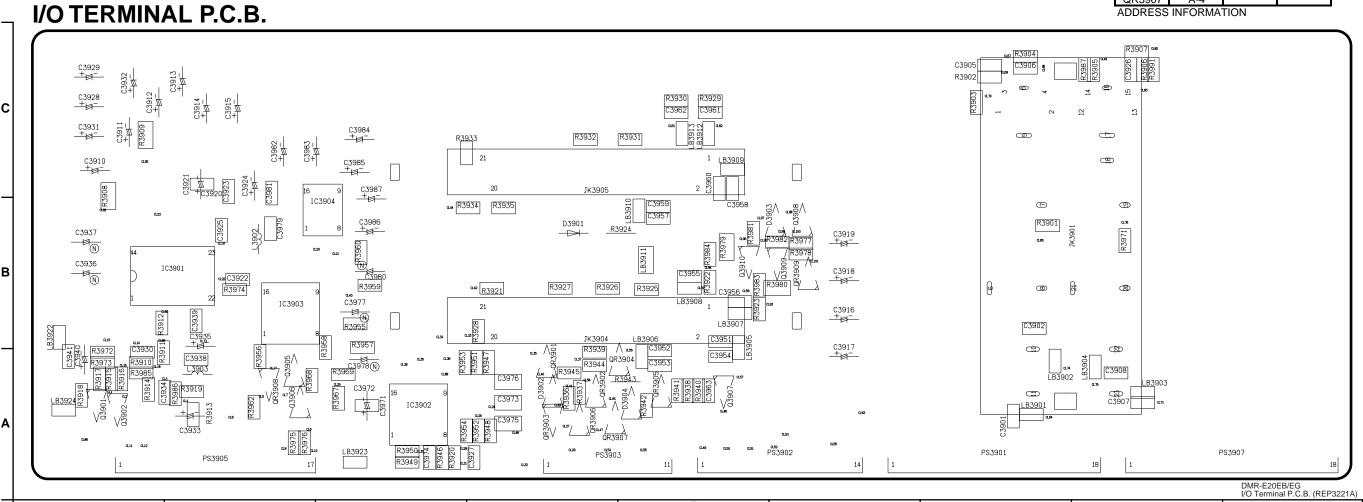
DMR-E20EB/EG VIFU P.C.B. (VEP07A23AL(DMR-E20EG)), (VEP07A23AM(DMR-E20EB)

3

1

I/O TERMINAL P.C.B.				
Trans	Transistor		A-2	
Q3901	A-1	QR3909	B-6	
Q3902	A-1	Integrate	d Circuit	
Q3905	A-2	IC3901	B-1	
Q3906	A-2	IC3902	A-3	
Q3907	A-5	IC3903 B-2		
Q3908	B-6	IC3904	B-3	
Q3909	B-6	Connector		
Q3910	B-5	JK3901	A-7	
Transistor	-resistor	JK3904	B-4	
QR3901	A-4	JK3905	C-4	
QR3902	A-4	JK3907	A-8	
QR3903	A-4	PS3901	A-7	
QR3904	A-4	PS3902	A-5	
QR3905	A-5	PS3903	A-4	
QR3906	A-4	PS3907	A-8	
QR3907	A-4			

ADDRESS INFORMATION



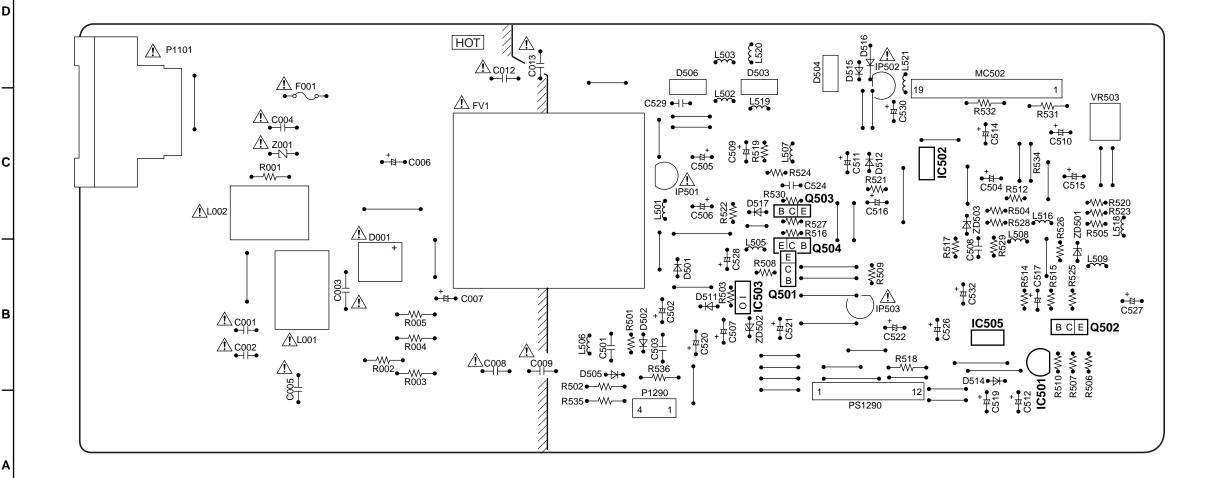
IMPORTANT SAFETY NOTICE: COMPONENTS IDENTIFIED WITH THE MARK / HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY THE SAME TYPE.

CAUTION

THE STRIPED FRAME INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT. PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

POWER SUPPLY P.C.B.			
Transistor		Connector	
Q501	B-6	FV1	B-4
Q502	B-7	MC502	D-7
Q503	C-6	P1101	D-1
Q504	B-6	P1290 A-5	
Integrated	Circuits	PS1290 A-6	
IC501	B-7	Volume	
IC502	C-7	VR503	C-8
IC503	B-5		
IC505	B-7		
ADDRESS INFORMATION			

POWER SUPPLY P.C.B.



DMR-E20EB/EG Power Supply P.C.B. (ETXMM357E4H)

2

MSD P.C.B.			
Integrated Circuit Connector			nector
IC7301	B-2	PK7301	A-1
IC7302	A-2	PK7302	A-2

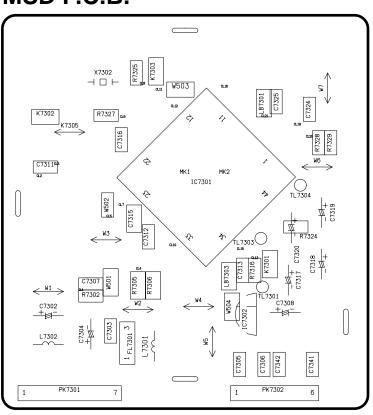
ADDRESS INFORMATION

MSD P.C.B.

C

В

Α

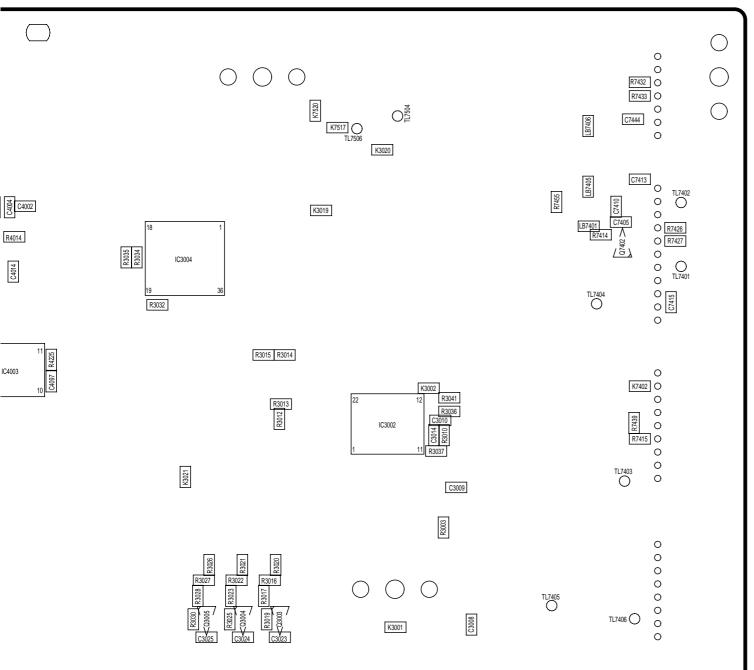


DMR-E20EB/EG MSD P.C.B. (VEP07A18AJ(DMR-E20EG)), (VEP07A18AA(DMR-E20EB)

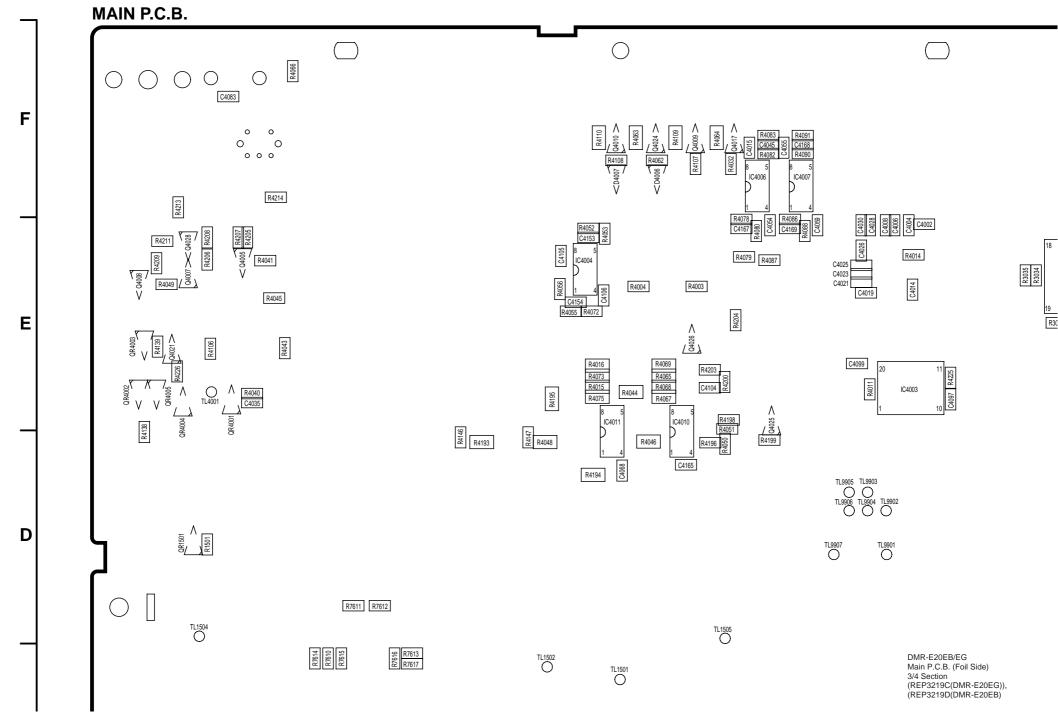
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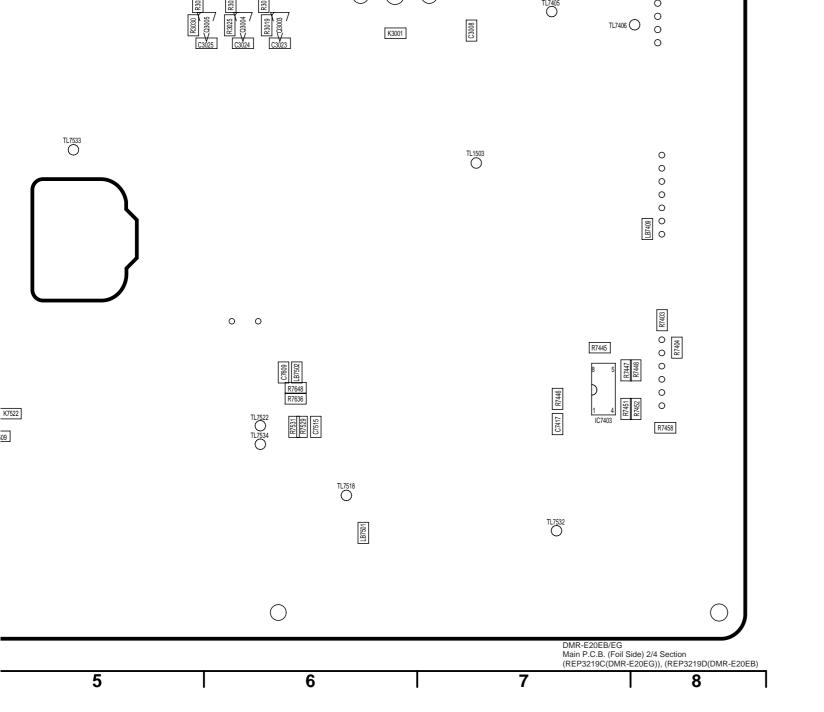
1

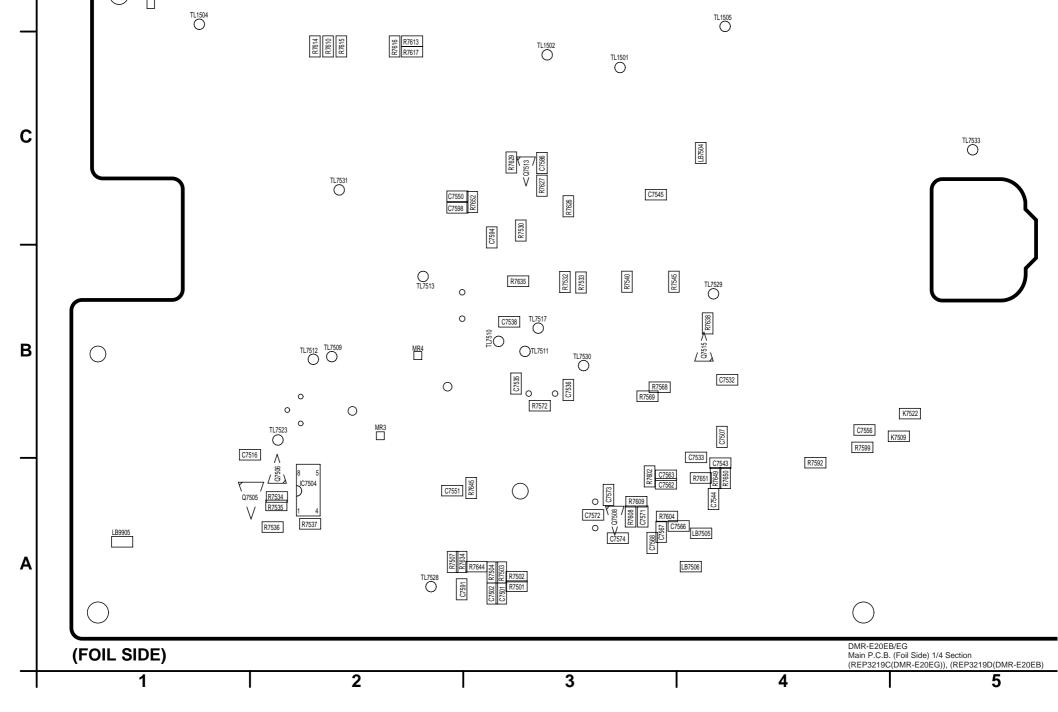
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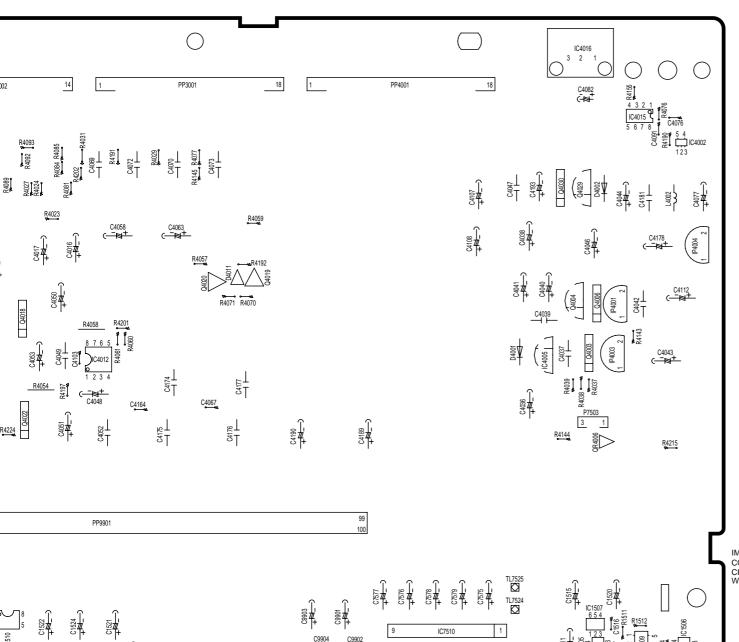


DMR-E20EB/EG Main P.C.B. (Foil Side) 4/4 Section (REP3219C(DMR-E20EG)), (REP3219D(DMR-E20EB)









IC7510

IMPORTANT SAFETY NOTICE: TOWN TANT SAFETY TOTICE:

COMPONENTS IDENTIFIED WITH THE MARK THAVE THE SPECIAL

CHARACTERISTICS FOR SAFETY.

WHEN REPLACING ANY OF THESE COMPONENTS.USE ONLY THE SAME TYPE.

DMR-E20EB/EG Main P.C.B. (Component Side) 4/4 Section (REP3219C(DMR-E20EG)), (REP3219D(DMR-E20EB)

+**T** C1519

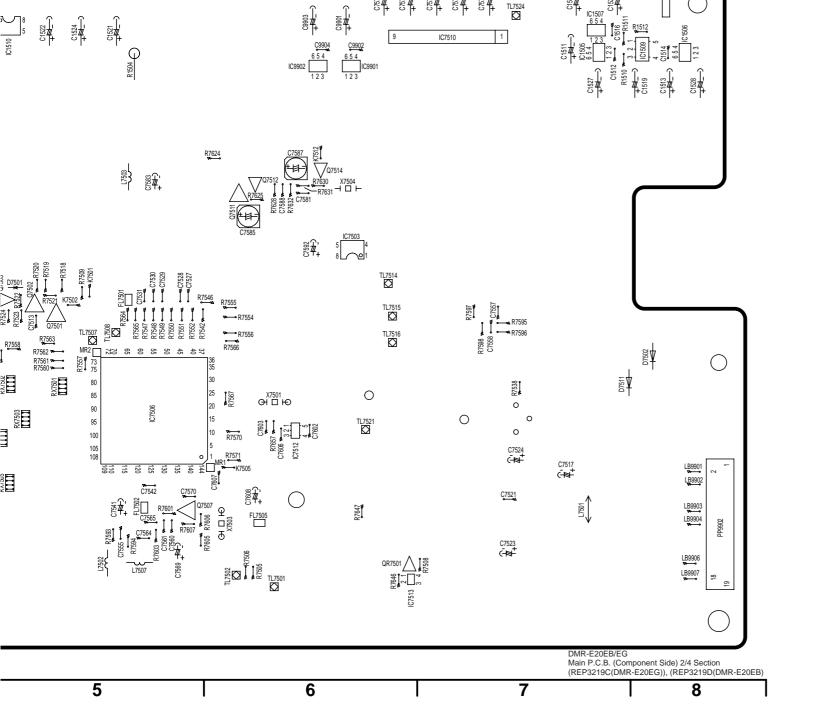
C1513 +

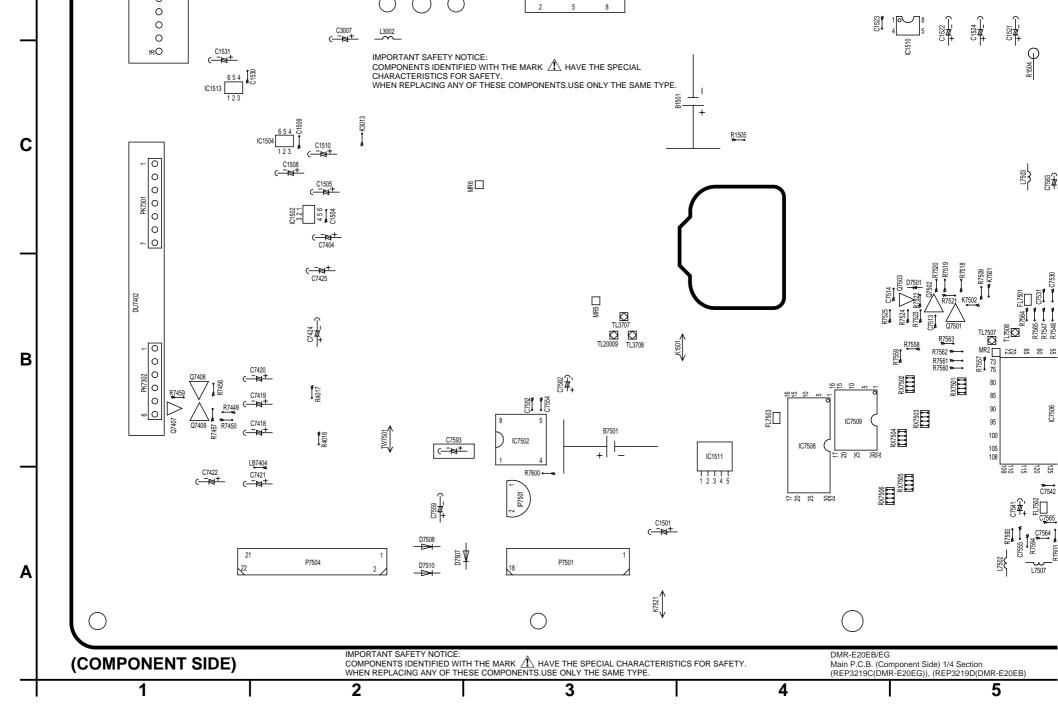
MAIN P.C.B. -0 0 14 17 PP3003 11 PP7403 PP3002 0 0 R7401 TL7503 TL7505 0 TL7527 K7504 (||||+ 0 C7406 ~O R4084 R4085 C3041 (3083 (1083) C7437 C7431 ∞O K7405 3064 0 C3036 R4023 R4020 R4010 0 S364 1384 144 K3018 0 C4016 IC7401 C3028 (D) §# C3063 0 (<u>"|||+</u> 3037 0 1 2 3 4 5 X307 R4007 C7441 C7402 0 R3033 K3005 K3006 C4012 654 0 0 C4009 123 0 R7440 C405 4 4 4 œΟ C4010 23017 L3003 C3018 ₽O R4036 R4054 C4048 0 C4164 0 0 0 0 R3008 0 0 ₽O DU7401 χO 0 FL3002 0 0 0 C1522 + C1524 + C1521 + 0 C3007 C = + L3002 0 DMR-E20EB/EG жO C1531 IMPORTANT SAFETY NOTICE: Main P.C.B. (Component Side) COMPONENTS IDENTIFIED WITH THE MARK A HAVE THE SPECIAL 3/4 Section (REP3219C(DMR-E20EG)), (REP3219D(DMR-E20EB) CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS.USE ONLY THE SAME TYPE. IC1513

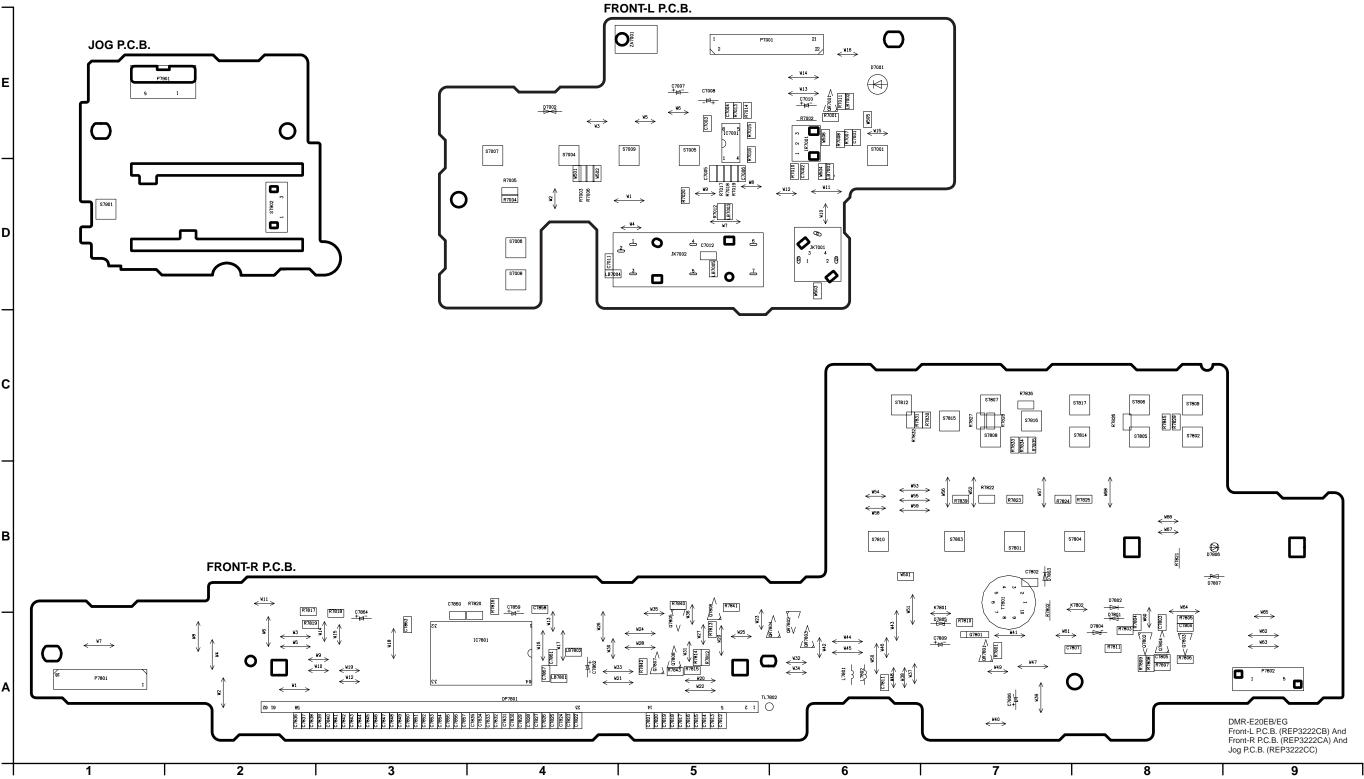
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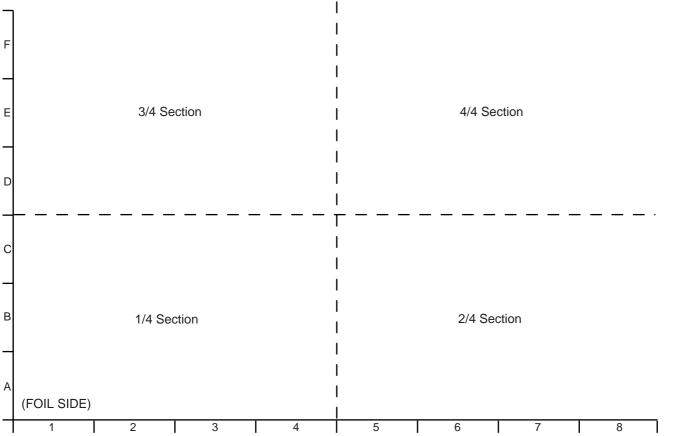
Ε

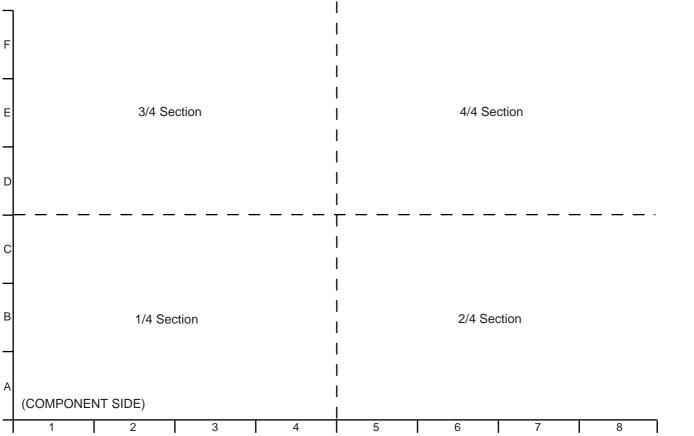
D











Before requesting service, make the below checks. If you are in doubt about some of the check points, or if the remedies indicated in the chart do not solve the problem, consult your dealer for instructions.

Power

No power	●Insert the mains lead securely into the household mains socket.
The unit is on but cannot be operated.	 The unit is hot ("U14" appears on the display). Wait for "U14" to disappear. One of the unit's safety devices may have activated. Reset the unit as follows: 1.Press [也/I] on the main unit to switch the unit to standby. If the unit doesn't switch to standby, press and hold [也] for about 10 seconds. The unit is forcibly switched to standby. Alternatively, disconnect the mains lead, wait one minute, then reconnect it. 2.Press [也/I] to turn the unit on.
The unit switches to standby automatically.	This is a power saving feature. You can turn it off if you would prefer (Settings—Off Timer—Off). Press [₺/l] to turn the unit on. One of the unit's safety devices may have activated. Press [₺/l] to turn the unit on.

Pictur

Picture	
No picture.	Make sure the television's input setting (e.g., AV1) is correct.
Television reception worsens after connecting the unit.	This can occur because the signals are being divided between the unit and the television. It can be solved by using a signal booster, available from audio-visual suppliers. Consult your dealer if reception does not improve.
Screen size is wrong.	 Check the settings on your television. Check the settings for "TV Aspect", "4:3 TV Settings for DVD-Video" or "4:3 TV Settings for DVD-RAM" in the Connection menu.
On-screen messages do not appear.	Go to Display in the SET UP menus and select "Automatic" for "On-Screen Messages". Press [STATUS] to show the on-screen messages constantly.
The grey background does not appear.	●Go to Display in the SET UP menus and select "On" for "Grey Background".

Sound	
No sound. Low volume. Distorted sound.	Check the connections. Check the input mode on the amplifier if you have connected one. Turn V.S.S. off if it causes distortion.
Cannot hear the desired audio type.	Press [AUDIO] on the remote control to select the desired audio type. DVD-R Go to Sound in the SET UP menus and choose the correct setting with "Billuingual Selection for DVD-R".
Cannot switch audio during stereo or NICAM broadcasts.	 You have used digital connection. Connect to other equipment using audio cables (analogue connection). You cannot change the audio type when using DVD-R.

Displays

The display is dim.	● Go to Display in the SET UP menus and change the display's brightness with "FL Display".
"0:00" is flashing on the unit's	The clock is not set. Go to Settings in the SET UP menus and set the clock with "Clock".

Play

-	
Play fails to start even when [▶, PLAY] is pressed. Play starts but then stops immediately. "U11", "NO DISC", or "Cannot Play" appears on the unit's display.	 Insert the disc correctly with the label facing up. This unit cannot play discs other than DVD-RAM, DVD-R, DVD-Video, Video CD, and CD. The disc is dirty. Clean it. The disc may be badly scratched. You inserted a blank DVD-RAM or DVD-R.
No response when buttons pressed.	● Some operations may be prohibited by the disc. ●If the unit is not operating at all, press [□, TIMER REC] to switch the unit to standby, then press [□, TIMER REC] again to turn the unit on. The unit may not be operating correctly due to lightning, static electricity, or some other external factor. ● The Child Lock function is activated.
A title or chapter doesn't play when it is selected.	Some titles and chapters on DVD-Video are not played when you have changed the ratings level.
Picture distorted during search.	●Some distortion is normal.
There is ghosting.	● Change the settings for "3D-NR", "Block NR", and "Mosquito NR" to "0", or turn "MPEG-DNR"-off with the on-screen menu icons.
Alternative soundtrack and subtitles cannot be selected.	The languages are not recorded on the disc.You may have to use the disc's menus to select languages.
Soundtrack/subtitle language not the one selected with the SET UP menus.	●The language is not recorded on the disc.
No subtitles.	Subtitles are not recorded on the disc. Turn the subtitles on.
Angle cannot be changed.	• This function depends on software availability. Angles can only be changed during scenes where different angles are recorded (" appears on the display).
You have forgotten your ratings password.	 Restore the ratings setting to the factory settings. While the disc tray is open, press and hold [I◄◄] and [►►I] at the same time for 5 or more seconds.

Remote control

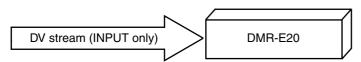
The remote control doesn't work.	 The unit is on standby to make a timer recording ("∑" on the unit's display is on). [DVD, TV] is not switched to "DVD". Switch to "DVD" when operating this unit. The remote control code is wrong. Change to the correct code. The batteries are depleted. Replace them with new ones. Point the remote control at the remote control sensor on the main unit. Remove obstacles from between the remote control and main unit.
Cannot operate the television.	 The remote control code is wrong. Change to the correct code. Some televisions cannot be operated even if you change the code. [DVD/TV] is not switched to "TV". Switch to "TV" when operating the television.

Recording and timer recording

Cannot record.	 You haven't inserted a disc or the disc you inserted cannot be recorded on. Insert a disc the unit can record onto. The disc is unformatted. Format the disc so this unit can record on it. The write protect tab on the cartridge is set to "PROTECT". Use a ballpoint pen or similar to release the write protection. The disc is full or nearly full. Delete unneeded programmes or use another disc. The material you are trying to record is copy-guarded.
Video Plus+ programming does not work properly.	 The guide channels are incorrect. Go to Settings in the SET UP menus and correct the guide channels with Video Plus+ Setting. The clock is wrong. Go to Settings in the SET UP menus and correct the clock with "Clock".
Timer recording does not work properly.	 The timer programme is incorrect. Make corrections to the programme and check them when you are finished. The unit is not on standby for timer recording. ("□" on the unit's display is not on.) Different timer programme times overlap. The clock is wrong. Go to Settings in the SET UP menus and correct the clock with "Clock".
The unit switches to standby while making a timer recording.	The unit switches to standby while making a timer recording if the disc runs out of space. Use a disc that has enough space to record the programme.
The timer programme remains even after recording finishes.	● The programme remains if you select weekly or daily setting.
The available recording time doesn't increase even after erasing all recordings on the disc.	The available recording time does not increase if you erase data written to the disc with the DVD-RAM drive of a computer. Format the disc if necessary.

Discs make sounds as they rotate. This does not indicate a malfunction.

Note:Connection with DV products



Slave(Playback)	Mastor(Recording)	Result	Comment
DVC cam.		OK	
DVC table		OK	
PC	DMD F00	NG	PC don't send DV stream.
DVD recorder (Other company)	DMR-E20	NG	It is possible to make a simple dubbing by operating each equipment by manual.
	DVC table	NG	
DMR-E20	PC	NG	
	DVD recorder	NG	

Error messages	Causes and solutions
No Disc.	You haven't inserted a disc. Correctly inserted a disc that this unit can play. The disc is upside down. If it is a single-sided disc, insert it so the label is facing up.
This is non-recordable disc.	The unit cannot record on the disc you inserted. The unit cannot record onto finalized DVD-R, DVD-Video, CDs, or video CDs. Insert a DVD-RAM or unfinalized DVD-R. You inserted an unformatted DVD-RAM. Format the disc with this unit.
This disc is not properly formatted. Formatting is necessary using DISC INFORMATION.	You Inserted an incompatible disc. Insert a compatible disc.
Please check write protect tab on the disc.	The write protect tab on the cartridge is set to "PROTECT". Use a ballpoint pen or similar to release the write protection.
Contents of this disc are protected.	The programme is write-protected. Release the protection with the direct navigator. The disc is write-protected. Release the protection with the disc protection sub menu of DISC INFORMATION.
Cannot finish recording completely.	◆The programme was copy-protected. ◆The disc is full. ◆Recording was not completed for some other reason.
Cannot record on the disc.	The disc is scratched. Use another disc. The disc is dirty. Clean the disc as described in these operating instructions.
Please set clock.	●The clock is not set correctly. Reset the clock using "Manual Clock Setting".
This disc may not be played in your region.	You tried to play a disc with a region number different from this unit's region number. This unit can play only play discs with the region numbers compatible with this unit.
Your selection exceeds the recorder's rating limit.	A ratings level has been set for DVD-Video with this unit. Temporarily unlock the unit with "Ratings" in the disc menu.

The self-diagnosis displays appear if a problem occurs with the unit.

The service numbers in the table appear when a problem occurs. • The service numbers are a "U" followed by two digits.



Service number	Unit status	Solutions
U11	The disc is dirty or badly scratched.	Follow the instructions in "Maintenance and Handling" to clean the disc if it is dirty. The disc cannot be played if it is scratched and this display doesn't disappear.
	You have inserted a disc the unit cannot play or record on.	• Insert a disc the unit can play or record on.
U14	The unit is hot.	 The unit switches to standby automatically for safety reasons and you cannot operate it. Wait for about 30 minutes for the service number to disappear. Select a position with good ventilation when installing the unit. Do not block the cooling fan on the rear of the unit.
U99	The unit fails to operate properly.	●Press [句] to switch the unit to standby. Now press [句] again to turn the unit on.
REMOTE DVD	The remote control code is wrong.	Change to the correct code.

Maintenance

To clean this unit, wipe with a soft, dry cloth.

- Never use alcohol, paint thinner or benzine to clean this unit.
- Before using chemically treated cloth, read the instructions that came with the cloth carefully.

Dust and dirt may adhere to the unit's lenses over time, possibly making it impossible to record or play discs.

Use the recommended DVD-RAM/PD lens cleaner

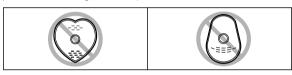
(LF-K123LCA1) every 1 to 4 months, depending on frequency of use and the operating environment.

Read the lens cleaner's instructions carefully before use.

The precision parts in this unit are readily affected by the environment, especially temperature, humidity, and dust. Observe the following points to ensure continued listening and viewing pleasure.

Disc handling

Do not use irregularly shaped discs, such as heart-shaped. (These can damage the unit.)



How to hold a disc

Do not touch the recorded surface.



If there is dirt or condensation on the disc

If the disc is dirty, wipe with a damp cloth and then wipe dry. Moisture may condense on discs after they are brought inside from the cold.

DVD-RAM and DVD-R

- Clean and dry only with the DVD-RAM/PD disc cleaner available as an optional accessory, part number LF-K200DCA1. Do not use cleaners or clothes for CDs to clean DVD-RAM and DVD-R.
- Never use cloths or cleaners for CDs, etc.

DVD-Video, Video CD and CD

Wipe it with a damp cloth and then wipe dry.



Handling precautions

- Do not write on the label side with a ball-point pen or other writing instrument.
- Do not use record cleaning sprays, benzine, thinner, static electricity prevention liquids or any other solvent.
- Do not attach labels or stickers to discs. (Do not use discs with exposed adhesive from tape or left over peeled-off stickers.)
- Do not use scratch-proof protectors or covers.
- Do not use discs printed with label printers available on the market.
- Do not use discs that are badly warped or cracked.

Do not place or store discs in the following places

- Locations exposed to direct sunlight
- Humid or dusty locations
- Locations directly exposed to a heat vent or heating appliance.

Bitstream

This is the compressed form of digital signals. A decoder decodes these signals into 5.1 surround and multi-channel signals.

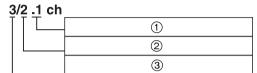
Channel (when referring to DVD)

Sound is divided into channels based on the sound's role.

For example, 5.1 channel

- Front speakers—1 left channel and 1 right channel
- Center speaker—1 channel
- Surround speakers—1 left channel and 1 right channel
- Subwoofer—1 channel×0.1 (the ratio of bass to the total amount of sound output)

Examples as shown in the on-screen menus



- (1) 1: Subwoofer signal (not displayed if there is no subwoofer signal)
- (2) 0: No surround
 - 1: Mono surround
 - 2: Stereo surround (left/right)
- (3) 1: Center
 - 2: Front left+Front right
 - 3: Front left+Front right+Center

Direct navigator

This is a list of programmes you have recorded. You can select programmes from the list to view. The list also shows the date and time of recording, the channel, and the titles of titled programmes. The selected programme is played in the background, making selection even simpler.

Dolby Digital

This is a method of coding digital signals developed by Dolby Laboratories. Apart from stereo (2 channel) audio, these signals can also be 5.1-channel audio. A large amount of audio information can be recorded on one disc using this method.

Dolby Pro Logic

A surround system where a 4-channel audio track is recorded as 2 channels and then is restored to 4 channels for play. The surround channel is monaural.

DTS Digital Surround

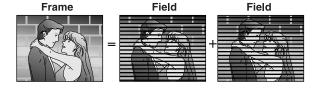
This surround system is used in many movie theaters around the world. The separation between channels is good and the compression ratio is low, so realistic sound effects are possible. DTS soundtracks are produced with the assumption that all channels will be used.

Finalize

This process allows DVD-R to be played on compatible equipment.

Frame and field

Frames are the still pictures that go together to make a moving picture. A frame is made up of two fields.



- A frame still is made up of two alternating fields, so the picture may appear blurred, but overall quality is high.
- A field still is not blurred, but it has only half the information of a frame still so picture quality is lower.

Linear PCM

This is a form of signal that has been digitized without compressing it. CDs are recorded with 44.1 kHz/16 bit PCM, while DVDs use PCM between 48 kHz/16 bit and 96 kHz/24 bit, allowing reproduction of greater quality sound.

The linear PCM signals output from the DIGITAL AUDIO OUT, OPTICAL terminal are stereo (2 channel).

NICAM (NICAM Broadcasting System)

This is a 2 channel sound broadcast system which in most instances provides high quality stereo sound. Broadcasters can also transmit two separate mono soundtracks on this system.

Pan&Scan/Letterbox

In general, DVD-Video are produced with the intention that they be viewed on a widescreen television with an aspect ratio of 16:9. This means you can view most material with the intended aspect ratio on a widescreen television.

Material with this ratio will not fit onto a standard television with an aspect ratio of 4:3. Two styles of picture, "Pan&Scan" and "Letterbox", deal with this problem.

Pan&Scan: The sides are cut off so the picture fills the screen.



Letterbox: Black bands appear at the top and bottom of the picture so the picture itself appears in an aspect ratio of 16:9.

Playback control (PBC)
This is a method of playing video CDs. You can select parts to play by using menus recorded on the disc.

Diameter.

This is a collection of scenes. It enables you to play these scenes in succession or to select specific ones to play.

Programme (PRG)

The section between the point where recording is started and the point where it is stopped.

Sampling frequency

This is the number of samples of sound taken per second during conversion to a digital signal. A high sampling frequency results in a sound close to the original when played back.

S-video output

The colour and luminance signals are separated before being sent to the television, making for greater picture clarity.

Q Link Function (For the United Kingdom)

When the unit is connected via fully wired 21-pin Scart lead to the TV. Q Link allows.

Download from the TVCopies the tuning set-up from your TV to your unit.

Direct TV recording:

Immediately records the same programme that you are watching on the TV.

TV/DVD Auto switch On:

whilst in standby mode pressing [▶, PLAY], [SV/V+] or [PROG/CHECK] will turn the TV and unit on.

Auto Switch Off:

When the TV is turned off, the unit will be turned off as well. This function works in the stop mode.

PDC (For the United Kingdom)

Programme Delivery Control adjusts the start and stop time of a timer recording automatically to ensure the recording starts and finishes in line with the programme broadcast. This is useful when a programme over-runs the published times.

The station must be transmitting PDC and the exact time must be set for PDC to work.

The unit detects whether a station is transmitting PDC only during the tuning process.

If PDC is introduced or discontinued by a station you will need to re-tune the unit before it becomes aware of this.

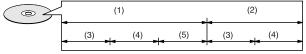
PDC transmissions are not currently nation-wide so please check with your local broadcaster for more information.

The beginnings of recordings may not be recorded correctly in some cases.

Title/Chapter (DVD-Video)

DVD-Video are divided up into large sections, titles, and smaller sections, chapters. The numbers allocated to these sections are called title numbers and chapter numbers.

Example

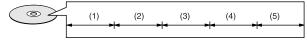


- (1) Title 1
- (2) Title 2
- (3) Chapter 1
- (4) Chapter 2
- (5) Chapter 3

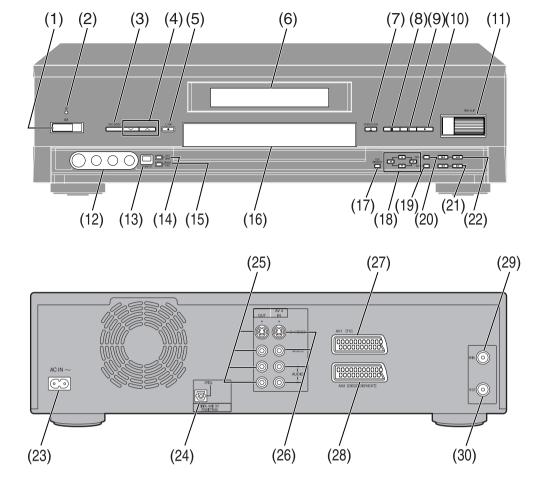
Track

This is the smallest division on CD, and Video CD, and usually equates to a single song.

Example



- (1) Track 1
- (2) Track 2
- (3) Track 3
- (4) Track 4
- (5) Track 5



Main unit

Front

- (1) POWER switch (也/I)
 - To switch the unit from on to standby mode or vice versa. In the standby mode, the unit is still connected to the mains.
 - In standby mode, the unit is still consuming a small amount of power.
- (2) Standby indicator
 - When the unit in connected to the AC power supply cord, this indicator lights up in standby mode and goes out when the unit is turned on.
- (3) Recording mode button (REC MODE)
- (4) Channel up/down button (A, V)
- (5) Recording button (●, REC)
- (6) Display
- (7) Disc tray open/close button (▲, OPEN/CLOSE)
- (8) Stop button (■)
- (9) Pause button (▮▮)
- (10)Play button (▶)
- (11)Time slip button and roller (TIME SLIP)
- (12)AV3 input sockets
- (13)DV input terminal (DV INPUT)
- (14)External link button (EXT LINK)
- (15)Timer recording button (□, TIMER REC)
- (16)Disc tray
- (17)Top window button (TOP WINDOW)
- (18)Cursor buttons (▲, ▼, ◄, ►)
- (19)Enter button (ENTER)
- (20)Return button (RETURN)
- (21)Slow/Search buttons (SLOW/SEARCH, ◀◀, ▶▶)
- (22)Skip buttons (SKIP, I◀◀, ▶►I)

Rear

(23)AC input socket

(24)Digital audio output socket

(25)S-video/video/audio output socket(s)

(26)AV4 input sockets

(27)AV1 (TV) socket

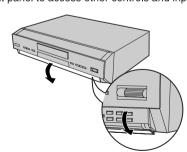
(28)AV2 (DECORDER/EXT) socket

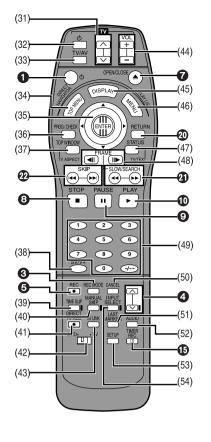
(29)RF input socket

(30)RF output socket

Opening the front panel

Open the front panel to access other controls and input terminals.





Remote control

(31)TV channel buttons (TV, A, V) (32)TV power on/off button (TV, (b)) (33)Television input mode selector (TV, TV/AV) (34)Top menu and Direct Navigator button (TOP MENU, DIRECT NAVIGATOR) (35)Joystick (▲, ▼, ◄, ▶)/Enter button (ENTER) (36)Manual programming and check button (PROG/CHECK) (37)Top window and TV aspect button (TOP WINDOW, TV ASPECT) (38)Video Plus+ button (SV/V+) (39)Time slip button (TIME SLIP) (40)Manual skip button (MANUAL SKIP) (41)Direct TV recording button (●, DIRECT TV REC) (42)DVD/TV switch (DVD, TV) (43)This button does not operate on this unit (44)TV volume up/down buttons (TV VOL, +, -) (45)Display button (DISPLAY) (46)Menu and Play List button (MENU, PLAY LIST) (47)On-screen menu display and TV/TEXT button (STATUS, TV/TEXT) (48)Frame advance and frame reverse buttons (FRAME) (49)Numeric buttons (0-9, - /- -) •When selecting a title, chapter, track, programme, or play list Example: "5": $[0] \rightarrow [5]$ Example: "15": [1] \rightarrow [5]

When selecting a page of play list scene

Example: "5": $[0] \rightarrow [0] \rightarrow [5]$ Example: "15": $[0] \rightarrow [1] \rightarrow [5]$

When selecting a television channel

Example: "5": [5]

Example: "15": $[---] \rightarrow [1] \rightarrow [5]$

(50)Cancel button (CANCEL)

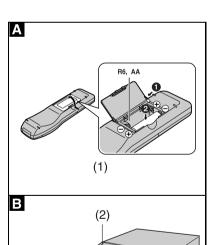
(51)Last marker button (LAST MARKER)

(52)Audio button (AUDIO)

(53)Set up button (SET UP)

(54)Input select button (INPUT SELECT)

Buttons such as 1 function the same as the controls on the unit.



(3)

(1) Push in and down on the (-) end.

- (2) Remote control signal sensor
- (3) 7 m
- (4) Switch [TV/DVD] to "DVD".

(4)

Batteries A

- •Insert so the poles (+ and −) match those in the remote control.
- Do not use rechargeable type batteries.

Do not:

- mix old and new batteries.
- use different types at the same time.
- heat or expose to flame.
- •take apart or short circuit.
- attempt to recharge alkaline or manganese batteries.
- •use batteries if the covering has been peeled off.

Mishandling of batteries can cause electrolyte leakage which can damage items the fluid contacts and may cause a fire.

If electrolyte leaks from the batteries, consult your dealer.

Wash thoroughly with water if electrolyte comes in contact with any part of your body.

Remove if the remote control is not going to be used for a long period of time. Store in a cool, dark place.

Replace if the unit does not respond to the remote control even when held close to the front panel.

Use B

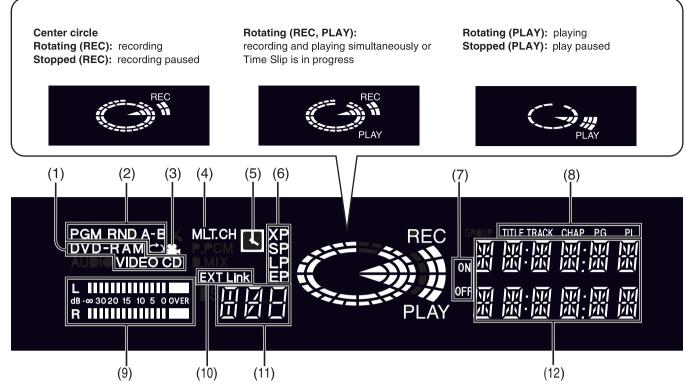
Aim at the sensor, avoiding obstacles, at a maximum range of 7 m directly in front of the unit.

- Keep the transmission window and the unit's sensor free from dust.
- Operation can be affected by strong light sources, such as direct sunlight, and the glass doors on cabinets.

Do not:

- put heavy objects on the remote control.
- \bullet take the remote control apart.
- spill liquids onto the remote control.

The unit's display



(1) Disc type

DVD-RAM: DVD-RAM
DVD-R: DVD-R

DVD VIDEO: DVD-Video **VIDEO CD:** Video CD **CD:** Audio CD

(2) Play mode

PGM: programme play **RND:** random play **A-B ○**: A-B repeat play

: repeat play

PGM : programme repeat play

(3) Multi-angle

(4) Audio signal type

MLT.CH: a signal with 3 or more channels

(5) Timer programme display

On:

when a programme for timer recording is on

Flashes:

when there are less than 10 minutes to go before timer recording is programmed, but the unit is not on standby.

(6) Recording mode

XP: High-quality mode

SP: Normal mode

LP: Long play mode (4 hours)

EP: Long play mode (6 hours)

XP SP LP EP (all on):

FR (flexible recording) mode (only with timer recording)

(7) Timer indicator

ON: the start time for a timer recording

OFF:

the end time for a timer recording or the time left until recording stops

(8) The display mode of the main display section

TITLE: title number
TRACK: track number
CHAP: chapter number
PG: programme number
PL: play list number

(9) Volume level meter

(10)EXT Link

On:

when EXT LINK function is on

(11)Channel

1, 2, 3,, 99 / AV1, AV2, AV3, AV4 / DV

(12)Main display section

Timer recording

Recording and play counter

Remaining disc time

Current time

Title, track, chapter, direct navigator and play list page

numbers

Miscellaneous messages

etc.

Discs you can use

The features you can use with the different types of discs are indicated as follows.



For your reference

- DVD-R indicates DVD-R that have not yet been finalized and can still be recorded on.
- DVD-R that have been finalized can use the same features as DVD-Video. (Refer to features indicated DVD-V.)

Discs you can use for recording and play Logos for the discs you can record on and play

Disc type	Logo	Regulation	Indication used in instructions
DVD- RAM	RAM 4.7	[4.7 GB / 9.4 GB, 5" (12 cm)] [2.8 GB 3" (8 cm)]	RAM
DVD- R	R R 4.7	4.7 GB for General Ver.2.0	DVD-R

The manufacturer accepts no responsibility and offers no compensation for loss of recorded or edited material due to a problem with the unit or disc, and accepts no responsibility and offers no compensation for any subsequent damage caused by such loss.

Examples of causes of such losses are

- A disc recorded and edited with this unit is played in a DVD recorder or computer disc drive manufactured by another company.
- (2) A disc used as described in (1) and then played again in this unit
- (3) A disc recorded and edited with a DVD recorder or computer disc drive manufactured by another company is played in this unit.

Note

- Do not allow the disc to become dirty or scratched. Fingerprints, dirt, dust, and scratches on the recording surface may make it impossible to use the disc for recording.
- If you use DVD-RAM cartridges, you can protect your recordings with the write protected tab. With the tab in this position, you cannot record to the disc, delete programmes with the direct navigator, edit with the play list screen, or format the disc.
- This unit is compatible with both non-cartridge and cartridge DVD-RAM, but cartridge-type discs give better protection to your valuable recordings.

For your reference

- DVD-RAM recorded on this unit cannot be played on incompatible players (including players manufactured by Panasonic).
- Using a Panasonic DVD-RAM, you can record broadcasts that allow you to make one copy, such as some satellite broadcasts.
- This unit cannot record PAL signals to discs containing NTSC signals or vice versa.
- This unit cannot record to discs containing both PAL and NTSC signals. Play of discs recorded with both PAL and NTSC on another unit is not guaranteed.

Play-only discs

Discs you can play-only and their logos

Disc type	Logo	Video system	Indication used in instructions
DVD- Video	DVD VIDEO	PAL / NTSC	DVD-V
Audio CD	COMPACT DIGITAL AUDIO	_	CD
Video CD	DIGITAL VIDEO	PAL / NTSC	VCD

Region Management Information (DVD-Video only)

Region number are allocated to DVD players and software according to where they are sold.

- For the United Kingdom: "2"
- For Hong Kong Special Administrative Region of China: "3"

DVD-Video can be played on this unit if their region number is the same or includes the same number, or if the DVD is marked "ALL". Confirm the region number for this unit before choosing discs. The number for this unit is indicated on the rear panel of the unit.

Playing CD-R and CD-RW

This unit can play CD-DA (digital audio) and Video CD format audio CD-R and CD-RW that have been finalized upon completion of recording.

It may not be able to play some CD-R or CD-RW due to the condition of the recording.

Note

• The producer of the material can control how these discs are played. This means that you may not be able to control play of a disc with some operations described in these operating instructions. Read the disc's instructions carefully.

Discs that cannot be played

- DVD-Video with a region number other than the number for this unit or "All'
- Some DVD-R
- DVD-RAM (2.6 GB/5.2 GB)
- DVD-ROM
- DVD-RW
- DVD-Audio
- •+RW
- ●CD-ROM
- CDV
- •CD-G
- CVD
- SVCD
- SACD
- MV-Disc
- PD
- Photo CD
- Divx Video Disc, etc. Discs
- Play of non-standard Video CDs and Super Video CDs is not guaranteed.

You can play DVD-R on compatible DVD players by finalizing [the process that allows recordings on DVD-R to be played on compatible DVD players] them on this unit, effectively making them into DVD-Video.

Before finalizing

You can record onto the available space on the disc and perform editing functions, such as giving titles to discs and programs and erasing programmes.

You cannot record to or edit DVD-R with this unit if it was recorded with another unit, whether it is finalized or not.

You cannot record over parts that have been recorded.

Erasing programmes will not increase the discis available time.

After finalizing

The video and audio is recorded according to the DVD-Video specifications, and your very own DVD-Video is created.

- The titles you entered with this unit appear as menus.
- Programmes longer than 5 minutes are divided into five-minute chapters.
- These DVD-R can no longer be recorded on or edited.
- These DVD-R can be played on other DVD players, but this is not guaranteed. Play may not be possible due to the player you are using, the

DVD-R, or the condition of the recording. Use this unit to play the disc if the player is unable.

Visit Panasonic's homepage for more information about DVDs. http://www.matsushita-europe.com/ (For the United Kingdom)

For your reference

- It takes about 30 seconds for the unit to complete recording management information after recording finishes.
- To record on DVD-R, this unit optimizes the disc for each recording. Optimizing is carried out when you start recording after inserting the disc or turning the unit on. Recording may become impossible after the disc is optimized more than 50 times.
- The first 30 seconds of a programme may not be recorded if you make successive timer recordings.
- The video is recorded in a 4:3 aspect irrespective of the video signal input. Use the television's screen modes to change the screen size for play.
- Some broadcasts carry signals that allow you to make one copy, but you cannot record these broadcast with DVD-R. Use DVD-RAM to record these kinds of broadcast.
- Play may be impossible in some cases due the condition of the recording.
- We recommend using DVD-R manufactured by Panasonic as they have been tested to be compatible with this unit.
- You cannot change audio type if a DVD-R is in the unit. Select the audio type (M1 or M2) before recording by going to "Bilingual Selection for DVD-R" in the "Sound" menu.

For details about the kind of audio recorded when using DVD-R and recording from DV equipment.

Audio format logos



Dolby Digital

This unit can play Dolby Digital in stereo (2 channels). Connect an amplifier with a built-in Dolby Digital decoder to enjoy surround sound.



DTS Digital Surround

Connect this unit to equipment that has a DTS decoder to enjoy DVDs with this mark.

Types of disc for the type of connected

When you use the discs recorded either PAL or NTSC, refer to this table.

TV type	Disc	Yes/No					
Multi-	PAL	Yes					
system TV	NTSC	Yes					
NTSC TV	PAL	No					
NISCIV	NTSC	Yes*1					
PAL TV	PAL	Yes					
FALIV	NTSC	Yes*2					

^{*1} If you select "NTSC" in "NTSC Signal Output", the picture may be clearer.

If your television is not equipped to handle PAL 525/60 signals the picture will not be shown correctly.

Discs and accessories

DVD-RAM

You can also record signals which allow you to make one copy, onto these discs.

9.4-GB, double-sided, type 4 cartridge:

LM-AD240E

4.7-GB, single-sided, type 2 cartridge:

LM-AB120E

(set of 3, LM-AB120E3)

4.7-GB, single-sided, non-cartridge:

LM-AF120E

(set of 3, LM-AF120Q3)

(For Hong Kong Special Administrative Region of China)

DVD-R

4.7-GB, single-sided, non-cartridge:

LM-RF120E

• DVD-RAM/PD Disc cleaner:

FLF-K200DCA1

DVD-RAM/PD Lens cleaner:

FLF-K123LCA1

^{*2} If you select "PAL 60" in "NTSC Signal Output", the picture may be clearer.

Ref No.	IC7801																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	-27.3	-27.3	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	5.0	3.5	4.3	4.1	0	0	5.0	2.3
PLAY	-27.3	-27.3	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	5.0	3.5	4.3	4.1	0	0	5.0	2.3
STOP	-27.3	-27.3	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	5.0	3.5	4.3	4.1	0	0	5.0	2.3
Ref No.	IC7801																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.2	0	-25.0	-25.0	-22.3	-22.3	-24.8	-15.0	-20.0	-24.0	-25.0	-25.0	-22.0	-24.5	-22.3	-27.3	-21.3	-22.3	-15.0	-24.8
PLAY	2.2	0	-25.0	-25.0	-22.3	-22.3	-24.8	-15.0	-20.0	-24.0	-25.0	-25.0	-22.0	-24.5	-22.3	-27.3	-21.3	-22.3	-15.0	-24.8
STOP	2.2	0	-25.0	-25.0	-22.3	-22.3	-24.8	-15.0	-20.0	-24.0	-25.0	-25.0	-22.0	-24.5	-22.3	-27.3	-21.3	-22.3	-15.0	-24.8
Ref No.										IC7	801									
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	-20.0	-23.3	-19.9	-24.9	-17.4	-22.3	-18.5	-21.6	-24.8	-27.3	-22.3	-27.3	-27.3	-27.3	-19.9	-20.7	-24.8	-24.8	-27.8	5.0
PLAY	-20.0	-23.3	-19.9	-24.9	-17.4	-22.3	-18.5	-21.6	-24.8	-27.3	-22.3	-27.3	-27.3	-27.3	-19.9	-20.7	-24.8	-24.8	-27.8	5.0
STOP	-20.0	-23.0	-19.9	-24.9	-17.9	-22.3	-18.5	-21.6	-24.8	-27.3	-22.3	-27.3	-27.3	-27.3	19.9	-20.7	-24.8	-24.8	-27.8	5.0
Ref No.	-	IC7801						-				- '		IC7	001	="	="	='		
MODE	61	62	63	64							1	2	3	4	5	6	7	8		
REC	-27.3	-27.3	-27.3	-27.3							0	0	0	-9.0	0	0	0	9.1		
PLAY	-27.3	-27.3	-27.3	-27.3							0	0	0	-9.0	0	0	0	9.1		
STOP	-27.3	-27.3	-27.3	-27.3							0	0	0	-9.0	0	0	0	9.1		
Ref No.		Q7802			Q7803				Q7804									6		
MODE \	Е	С	В		E	С	В		Е	С	В		Е	С	В		Е	С	В	
REC	0	-0.4	0.7		1.4	-0.7	0.9		-21.9	0	-21.2		-25.0	5.0	-24.9		-25.0	5.0	-24.9	
PLAY	0	-0.4	-0.7		1.4	-0.7	0.9		-21.9	-5.0	-21.2		-25.0	5.0	-24.9		-25.0	5.0	-24.9	
STOP	0	-0.4	-0.7		1.4	-0.7	0.9		-21.9	-5.0	-21.2		-25.0	5.0	-24.9		-25.0	5.0	-24.9	
Ref No.		Q7807				Q7808					,				,					
MODE	Е	С	В		E	С	В													
REC	-25.0	5.0	-25.0		-25.0	5.0	-24.9													
PLAY	-25.0	5.0	-25.0		-25.0	5.0	-24.9													
STOP	-25.0	5.0	-25.0		-25.0	5.0	-24.9													
		0.0306:				00705				007067			1	0070-						
Ref No.	QR7801 QR7802				QR7803				QR7804						1					
MODE	E	С	В		E	С	В		Е	С	В		E	С	В					
REC	0	-0.4	-0.4		5.0	-0.4	5.0		0	0.5	0		5.0	4.8	0					
PLAY	0	-0.4	-0.4		5.0	-0.4	5.0		0	0.5	0		5.0	4.8	0					
STOP	0	-0.4	-0.4		5.0	-0.4	5.0		0	0.5	0		5.0	4.8	0					

Ref No.	IC701																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC		-	2.0	3.2	1.7	2.1	3.3	4.4	4.4	4.2	0	4.5	2.5	4.1	0.1	-	5.0		2.9	2.9
PLAY		-	1.6	3.2	1.7	2.1	3.3	4.4	4.4	4.2	0	4.5	2.5	4.1	0.1	-	5.0		2.9	2.9
STOP	-	-	2.0	3.2	1.7	2.1	3.3	4.4	4.4	4.2	0	4.5	2.5	4.1	0.1	-	5.0		2.9	2.9
Ref No.		IC7	701																	
MODE	21	22	23	24																
REC	3.4	2.2	2.2	-																
PLAY	3.4	2.2	2.2	-																
STOP	3.4	2.2	2.2	-																
Ref No.		Q702																		
MODE	Е	С	В																	
REC	3.2	5.0	2.8																	
PLAY	3.2	5.0	2.8																	
STOP	3.2	5.0	2.8																	